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Hemorrhagic Septicemia in Sheep

By E. T. BAKER, D. V. M., Moscow, Idaho

CATARRHAL fever of sheep; septicemia hemorrhagica ovis; infective pneumo-enteritis; pasteurellosis; plague. It is also found to be the exciting cause in some outbreaks of "cornstalk disease," "mad itch," "blind staggers," cerebrospinal meningitis, dysentery, bloody flux, "murrain," and conditions known by many other colloquial terms.

By often appearing simultaneously with outbreaks of anthrax, malignant edema and blackleg, its importance as a mixed infection is just beginning to be realized.

The disease has been described under many different names for years by writers in all countries. The first real attention was drawn to hemorrhagic septicemia in Europe in 1878, when it assumed the proportions of an epizootic among deer, and was known as the "deer and cattle disease." In 1885 our Bureau of Animal Industry identified as the causative agent of this "deer plague," the same organism found in swine plague. For the next twenty-five years very little definite knowledge was gained, as the disease assumed so many different forms, attacking all domestic and even wild animals. Wilson and Brimhall, of Minnesota, in 1899, contributed a valuable addition to our knowledge of the disease, while Newsom of Colorado has recently carried on an exhaustive research on the ovine type. Lytle, of Oregon, made the first investigations of the disease affecting sheep on the range, and successfully used the bacterin made from cultures of the ovine type of the hemorrhagic septicemia organisms. In 1911 a strange infection suddenly attacked the buffaloes in the Yellowstone National Park, which, after a bacteriological examination was found to be due to the invasion of the hemorrhagic septicemia organism. By the use of an autogenous bacterin the disease was controlled. Since then much valuable investigation has been made by various workers, and the true significance of hemorrhagic septicemia, as a primary disease or as a secondary factor, is beginning to be fully realized.

In the past several years, many cases of obscure maladies among our domestic animals have been found to be hemorrhagic septicemia, either alone or in conjunction with some other disease. On account of it assuming so many guises, appearing at first in a virulent form and rapidly subsiding, becoming chronic, or attacking animals isolated from all possible sources of infection, the knowledge we have of its ravages today is due to repeated bacteriological examinations.

Cause: The bacillus ovisepticus, or bacillus bipolaris septicus, a short, nonmotile, non-spore-forming organism. It is about one-twenty-eight-thousandth of an inch long, and one-thirty-eight-thousandth of an inch in width. It does not stain by Gram's method, but does stain with the anilin dyes. Often, the bacillus stains

very distinctly at each end, with an almost transparent center. It is ovoid in shape, and grows in bouillon, agar and gelatin. It does not liquefy gelatin, sour milk nor form gas in sugar media.

Bacilli Widely Distributed

Bacilli closely resembling the true organism are widely distributed as harmless saprophytes, and may be found in the air, soil, water or plants. A plausible theory is that these comparatively benign germs enter the systems of poorly nourished animals and increase in virulence until they assume the pathogenic violence of an epizootic. This may explain why outbreaks have occurred among bands of sheep isolated in high mountains, far away from any possible source of animal infection by additions to the flock. After the virulence spends its force, the disease becomes self-limiting, finally abates, and the organisms again assume their quiescent form. Much remains to be learned about hemorrhagic septicemia, and the future will undoubtedly reveal much of value to the investigator.

The bacilli may enter the body by the skin, as in blackleg; by the lungs, as in pneumonia; and through the intestinal tract, as in enteritis. Because of these erratic invasions, no two cases may assume the same form. It is this phase of the disease that makes hemorrhagic septicemia so hard to diagnose without the aid of a bacteriological examination. It is also very difficult to convince the stock owner that so many different "diseases" may be caused by the same germ.

The bacilli are found in the blood and in the hemorrhagic spots. The exact mode of transmission is not definitely known, neither do animals of different species infect each other as a rule. Unlike anthrax, no case of infection in man has ever been noted.

Symptoms: As above stated, it is very difficult to give a clear clinical picture, as in blackleg. The presence of small hemorrhagic spots in the diaphragm, heart walls, fourth stomach and intestines, not accompanied by gas-forming lesions, may greatly help one to arrive at a probable diagnosis.

Often, it first appears in the peracute form, and one to many sheeep are found dead before any symptoms of illness have been noted by the owner. Some time later, several more may be found dead, and others show signs of sickness. The latter seem weak, refuse to eat, have labored respirations, with drooling from the mouth, and uncertain gait; later, toward the end, convulsions or "fits" take place. The temperature will be found very high, running from 106 to 110° F. There may be great thirst, which is more often seen in the chronic type, and the clinical picture may greatly resemble plant poisoning, blackleg or pneumonia.

Three Forms Differentiated

Three forms of hemorrhagic septicemia may be differentiated: the pectoral or pulmonary; the intestinal, and skin or exanthematous form. Each of these may assume either the peracute, the acute or the chronic type.

1. *Pectoral or pulmonary form.* The victim is usually found dead, or, if alive, standing with legs stretched wide apart, breathing rapidly, and with a frothy, bloody exudate coming from the mouth or nose. The eyes may be bloodshot, with a slight discharge of mucus. Frequently, it seems to suffer colicky pains or the "stretches" before going into a fatal convulsion. Muscular tremors similar to strychnin or other plant poisoning may be present. This applies more particularly to the acute type, as those with the peracute type are usually found dead, or drop over in an apoplectic fit. The chronic type greatly resembles pneumonia in its various phases. The course of the pectoral form may be from several minutes to a couple of weeks, the usual duration being from one to three days.

2. *Intestinal form.* This is often secondary to the pectoral. There is profound depression, later merging into stupor, as the animals lie on their sides, and apparently are dead. At first, there is constipation, followed often by a diarrhea containing traces of blood or shreds of mucous membrane. This type often resembles forage poisoning, and in cases where slightly molded silage or alfalfa is fed, the greatest trouble is to differentiate hemorrhagic septicemia from this group of intestinal toxemias.

3. *Exanthematous or skin form.* This is rather rare in sheep, due to the protection by the wool. However, in epizootics where lesions simulate necrobacillosis invasion, with unusual fatalities, one should be on the guard for hemorrhagic septice-

mia. This form is very difficult to differentiate from blackleg, malignant edema or anthrax, although in the two former gas is found, while an examination of the spleen will dispose of the latter.

Anatomical Changes: In the pectoral form, there may be found in the lungs areas of hepatization, with purplish spots. The coverings of the lobes may be greatly inflamed, while the fluids will be of a bloody, frothy nature. By carefully keeping the diaphragm free from blood numerous small hemorrhagic spots, ranging from the size of a pinhead to that of a bean, will be found. Similar and even larger petechiæ may be found on the pericardium and walls of the heart, near the large vessels.

The lymphatic glands may be swollen and hemorrhagic.

The fourth stomach may be found very much inflamed.

In the intestinal form, much inflammation of the mucous membrane may be found, and enteritis present. The kidneys may be found injected, with many hemorrhagic spots in the connective tissues, as well as in the lymph-glands.

In the exanthematous form swellings may be found on the shoulder, rump, and on the throat, resembling blackleg; however, there is no gas present.

In all forms the spleen remains normal.

Differential Diagnosis

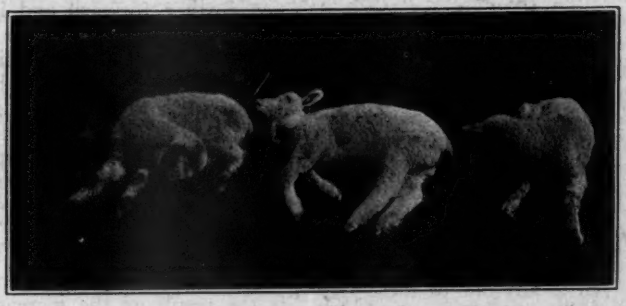
Blackleg usually attacks lambs only, and on known infected soil. There are the characteristic gaseous lesions, with the well known "crinkling" sound, when the hand is passed over these swellings.

Anthrax is easily distinguishable by the "blackberry" spleen. It runs a rapid and fatal course, spreading to other animals, including man. The greatest difficulty is encountered when anthrax and hemorrhagic septicemia appear in the same outbreak.

Malignant edema is characterized by the formation of gas, and is more of a wound disease, following castration or docking.

Plant poisoning is unaccompanied by the hemorrhagic spots in the thoracic or abdominal viscera, although a severe enteritis may be present. The sudden onset of the outbreak, the presence of toxic plants, and characteristic convulsions, all help one to diagnose the trouble as poison.

Pneumonia assumes a more constant, febrile type, with less rapid exhaustion and emaciation. Usually, the lungs are the only organs exhibiting lesions, while a history of exposure will lead to a comparatively easy diagnosis. However, when hemorrhagic septicemia occurs coincidently with pneumonia, the diagnosis may be rendered still more cloudy by the presence of bipolar organisms found upon a microscopic examination.



Lambs killed by hemorrhagic septicemia.

Bacteriological Examination

In all cases where there is the least doubt, a bacteriological examination should be made. The pluck (heart and lungs) should be taken from a fresh carcass, packed on ice, and sent to a laboratory as quickly as possible. A complete history of the case, with clinical symptoms, and other data obtainable will help the pathologist in his work. Where this procedure is not feasible, small pieces of affected tissue, glands, or muscle may be sent, rolled in boric acid, or immersed in glycerin or alcohol. Small vials of blood may also be sent. These, however, are of little value

(*Continued on page* 308)

Lameness, Consideration of Predisposing Causes as an Aid in Diagnosis

By M. H. McKILLIP, M. D., V. S.,
President, McKillip Veterinary College, Chicago

Conformation

THE conformation of an animal has an extremely important bearing on its ability and usefulness. Conformation has just as important a relation to the lamenesses to which the animal is heir, This is particularly true of the rapid gaited horses, although it has a bearing in all types. Conformation has a bearing only on those lamenesses due to use and overuse and plays no part of importance in the etiology of lamenesses due to infections. Perfect conformation in domesticated horses has probably never been attained. In many of our animals the conformation is far from perfect or even far from satisfactory. In considering this subject it will be necessary to discuss the extremes of conformation types in relation to the lameness. This will bring out more clearly the value of considering conformation as an aid in diagnosis. Naturally this is only one ot the various factors to be taken into consideration in the diagnosis of lameness and must be considered in its proper relation to the various other factors which have been discussed heretofore and to be discussed in subsequent articles. Too much significance must not be given to any one of these factors to the exclusion of others that may have a greater bearing.

In a study of conformation as related to lameness it is necessary to deal only with those defects of conformation that influence the structures of locomotion and traction. This resolves itself into a consideration of (1) the unequal distribution of weight support as applied to the two pairs of limbs or as applied to the individual structures of a single limb, (2) the unequal absorption of concussion by the individual structures of a limb and (3) the disproportion in the strength of the parts of a limb as affected by propulsion and traction.

General Conformation

Under this heading is to be considered the general contour of the axial skeleton and trunk structures and the general contour and development of the limbs with particular reference to their relation to the axial skeleton. The proportion of weight supported by the fore and hind limb varies with this general conformation. As weight support varies, development of limbs and peculiarities of action will also vary. These variations naturally influence the injuries to which the limbs are exposed. In horses that are low in front, high behind and with a trunk correspondingly oblique the center of gravity is displaced forward to an unusual degree, adding a burden of weight support to the front limbs. The abdominal viscera is carried further forward and is an important factor in the shifting of the center of gravity. As an evidence of this feature these animals are particularly light in the region of the flank. The disproportion in the distribution of weight is made worse by the natural tendency, in this type of horse, for the shoulders to become more muscular and heavy and the hind quarters to become less muscular and less heavy. This peculiarity of development is partially the result of an inherited tendency, but more particularly it is the result of the increased weight support demand of the front limbs as more weight is to be carried by these limbs, more muscle and bone and tendon is developed. Another factor that is productive of these heavy shoulders is the increased amount of traction and propulsion effort that falls upon these limbs in this type of conformation. It may readily be seen that the more weight a limb supports the more useful that limb becomes to the animal in propulsion and traction efforts and the more it must be used in the supreme efforts of locomotion. Causes that produce these conditions of development in the front limb will naturally influence the development of the hind limb in a contrary manner. The hind limbs, being less used in weight support will also be much less used in traction and propulsion, hence muscular, bony and connective

*This is a continuation of the series on "Lameness," by Dr. McKillip, the last of which appeared October, 1918.

tissue development will be correspondingly light.

The next point of importance is the effect that this combination of the developmental peculiarities will have upon the functional activities of the limbs. Normally the front limbs play a certain lesser part in propulsion and traction. The assuming of a larger than normal share of these functions, as is required in animals of this conformation, modifies materially the range and character of the movements of these limbs in the various gaits. The range of motion is decreased, the motion is less free, the backward stride is magnified in strength and slightly in range, the forward stride correspondingly loses in range, and the elasticity of the whole mechanism is less perfect than normal. The gait is said to be "stilty." The bones of the front limb are relatively shorter than normal and the joints are less angular. The conformation is "stilty" as well as the action. The shoulders, elbows, and the fetlocks are upright and the hoof is round, unusually strong and high-heeled. A good share of these anatomical and physiological conditions are inherited but most of them are the results of developmental demands.

These animals are inclined to be long-bodied and light in the flank. The lightness of the flank is due in part to a light muscular and bony development and in part to the tendency for the abdominal viscera to be carried farther forward as a result of the inclination of the ventral abdominal wall. This combination of peculiarities gives to such an animal an appearance that causes it to be dubbed a "poor doer." The hind limbs are light in comparison to the front limbs for reasons previously stated. The position of these limbs relative to the body and the range and character of their motions is influenced by the peculiarities of the front limb. They must harmonize in action. Thus they become "stilty" in conformation as well as in action. The angularity of all joints is less than normal.

This type of conformation predisposes to certain groups of lamenesses. Lameness in the front limb is far more common than lameness in the hind. The lamenesses of the front limb are chiefly of the true concussion type. The flexor structures, the check ligament structures and the suspensory apparatus are particularly immune. Bone, joint and hoof injuries are the more common. Thus the conformation suggests corns, laminitis, sidebones, ringbones, splints, navicular arthritis, carpitis, etc., as possible causes of the lameness in question.

The opposing extreme of general conformation is that of the high withers, low croup and corresponding obliquity of the trunk. This produces in an animal an opposite locomotory quality and lameness potentiality. The center of gravity is farther back. The hind limbs assume a greater proportion of weight support and a correspondingly greater proportion of the functions of propulsion and traction. The front limbs necessarily are correspondingly relieved of portions of these functions. The anatomical development varies accordingly. The hind limbs are heavier and stronger in all of their parts; the front limbs, lighter. Through heredity and development, angularity of joints is increased. The roofs are oval, with lighter walls and lower heels. Tendinous and ligamentous structures along the posterior surfaces of the limbs are more heavily developed and the bony structures are slightly less strong.

The locomotory activity in these animals is very different from that of the previous group. The front limbs, being relieved of a certain share of the function of weight support and a greater share of propulsion and traction efforts, are permitted a much greater freedom of acivity. The inclination of the axial akeletal and trunk structures adds to this freedom as does also certain peculiarities of muscular development. A high, elastic and reaching movement of the forelimbs is the result. The anterior stride is magnified and the posterior stride is decreased. The range of activity of these limbs is forward rather than backward. The hind limbs, carrying more weight, become much greater factors in propulsion and traction. The musculature and skeleton of these limbs are well developed and they acquire an immense driving power especially in the supreme efforts of locomotion. The peculiarities of the action of the forelimbs is reflected in the action of the hind. The elastic, high and reaching qualities are just as pronounced.

These animals are inclined to have short and heavy backs. The flanks are full and rounded as a result of muscular development and of a backward displacement of

the abdominal viscera. They are the so-called "good doers."

Certain groups of lamenesses are more or less peculiar to this type of conformation. Lameness in the hind limb is of much more frequent occurrence. It is probably more common than lameness in the front limb. Suspensory structures, check ligaments and the flexor tendons suffer to a far greater degree than do the bony columns. The peculiarity of conformation reduces concussion on the bony column to a minimum. The obliquity of the various segments of the limb predisposes the tendinous and ligamentous structures to injury. Curb, sesamoidan disease and suspensary ligament injuries in the hind limb are especially common. The flexors of the knee and foot, the check ligaments, the suspensory ligaments and the sesamoidean structures are the points of weakness in the front limb.

Leg and foot conformation, particularly the latter, has a very specific relation to lameness as a predisposing cause. Some features of this subject have already been discussed. The subject will be taken up more fully in a subsequent article.

Studies on the Hyperimmunization of Hogs Against Hog Cholera

By M. DORSET, C. N. McBRYDE, W. B. NILES and J. H. RIETZ, Biochemic Division, Bureau of Animal Industry, United States Department of Agriculture

HOLMES of the Indian Civil Veterinary Department in a report of the research work of the Imperial Bacteriological Laboratory, describes certain experiments with improved methods of anti-rinderpest serum preparation in which he shows that immediately following immunization against rinderpest there is a "negative phase" during which the injection of a smaller amount of virus is required to produce hyperimmunization than later when the immunization may be said to have taken on a "positive phase," and when it is believed a portion of the hyperimmunizing dose of the rinderpest virus blood is neutralized by the antitoxin already existing in the blood of the immunized animal.

He furthermore states that a more potent serum is obtained when virus blood is drawn directly in a 0.5 per cent potassium citrate solution and injected after hemolysis of the red cells has taken place than was secured by the injection of an equivalent amount of undiluted defibrinated blood.

He attributes this to the fact that the virus is partially, at least, freed from the red cells through the process of hemolysis and also to the fact that diluted blood is more quickly absorbed, thus producing a more rapid effect upon the injected animal.

This work of Holmes suggested to the authors the possibility of certain improvements in the production of anti-hog cholera serum. Perhaps a more potent serum could be obtained if the hyperimmunizing injection was made during the so-called "negative phase" of immunity, or it might be that a considerable saving could be effected by the use of a smaller amount of virulent blood at the time of the "negative phase." This would constitute an important saving, since virulent blood is one of the principal items of cost in the production of anti-hog cholera serum.

Furthermore, if hemolysis of the virus blood used for hyperimmunizing would result in the production of a more active antigen than the undiluted defibrinated blood commonly used, an important saving might be effected in the amount of virus blood used and experimental work was undertaken to determine these matters.

Hyperimmunization at the Negative Phase

In carrying out the experiments, a number of susceptible pigs were first given simultaneous inoculations of serum and virus and were later hyperimmunized after intervals of one day, two days, five days, seven days, nine days, ten days and 3, 4, 5, 6, 7 and 8 weeks, respectively. At the one-day, two-day and five-day intervals the pigs were hyperimmunized with 5 cc. of virus per pound, at the seven-day, nine-day and ten-day intervals one pig was

*Abstract of the manuscript for a bulletin of the Bureau of Animal Industry. The bulletin will contain numerous tables and other details of the experiments.

given the regular hyperimmunizing injection of 5 cc. of virus per pound and another pig was given 2.5 cc. of virus per pound, or one-half of the regular hyperimmunizing injection; while at the longer intervals 1 pig was given 5 cc. of virus per pound. These pigs, which may be termed "short-interval immunes," weighed from 95 to 205 pounds at the time of hyperimmunization.

The same viruses which were used for the hyperimmunization of the short-interval immunes were also, at the same time, used for the hyperimmunization of "regular immunes," that is, pigs had been through serum tests and had thus received the simultaneous treatment when they weighed from 40 to 65 pounds. They showed no symptoms of illness following this treatment and were not again exposed to disease until virus was administered for hyperimmunization. At the time of hyperimmunization these regular immunes weighed from 163 to 210 pounds and were therefore approximately of the same weight as the short-interval immunes. The interval between the immunization and the hyperimmunization of the regular immunes was from three to six months. These hogs were hyperimmunized in order that we might have a control on the antigenic properties of each of the lots of virus used in the hyperimmunization of the short-interval immunes. The regular immunes were hyperimmunized and bled on the same dates as the corresponding short-interval immunes and the serums thus obtained were tested for potency in the same way as those obtained from the short interval immunes.

Two weeks after hyperimmunization, all of the hyperimmunized hogs, both the regular and the short-interval immunes, were bled and serum was prepared from each in the usual manner by defibrinating the blood and adding 0.5 per cent of phenol.

These serums were tested on susceptible pigs, a serum from a regular immune being compared in each instance with the serum from one of the short-interval immunes. In carrying out the tests of the different serums, susceptible pigs weighing from 35 to 85 pounds each were used. Six pigs were used in testing each serum, two pigs received 5 cc. each of serum, subcutaneously, two received 10 cc. each, and two received 15 cc. each. Each pig at the same time received a subcutaneous injection of 2 cc. of virus in the groin opposite to that in which the serum was injected. A certain number of pigs were injected with the virus alone to serve as controls.

Results Striking

The results were very striking. Every one of the eleven regular long interval immunes yielded a serum of good potency, while only one hog among the thirteen that were hyperimmunized within six weeks after simultaneous inoculation yielded a serum potent enough for use in practice. Furthermore there was almost complete lack of potency in the serums from the hogs that were hyperimmunized within ten days after they were immunized. Of the nine hogs hyperimmunized during that period, three were given only half as much virus per pound of body weight as was given to the other hogs in this group and to the regular long interval immunes. These three hogs are therefore excluded from consideration in the discussion of the results of serum tests.

The serums from the six hogs that received 5 cc. of virus blood per pound within ten days after immunization were tested on 36 susceptible pigs, six pigs for each serum. Of these test pigs, 29, or 80.5 per cent, died of hog cholera. There is an indication that some of these serums had a slight protective value but in none of them was this evident in a degree comparable to that shown by the serums from the regular (long-interval) immunes.

The serums obtained from the hogs that were hyperimmunized from three to six weeks after immunization were somewhat more potent than those from the preceding group of pigs, yet they were, on the whole, distinctly inferior to the serums from the regular immunes. Of 24 pigs used to test these serums five, or 20.8 per cent, died of hog cholera, in spite of the fact that some had received the larger doses of serum.

The serums from the pigs that were hyperimmunized seven and eight weeks respectively, after immunization, appeared to be of good potency, as only one test pig out of 12 (8.3 per cent) died and that one received the smallest serum dose.

Serums were obtained from eleven regular (long interval) immunes, and these were tested in groups along with the serums from the short interval immunes, the same virus being used for the test pigs

in both groups. A total of 66 test pigs were used for the regular immune serums and two of these (3.3 per cent) died during the tests. The two which died each received only the smallest dose of serum.

As a control on the virus used in the tests, several susceptible pigs were always inoculated with the same virus in the same dose as that used for the test pigs.

All of these controls developed hog cholera.

From the above results it is evident that in the case of hog cholera, hyperimmunization shortly after immunization, or during the so-called "negative phase," is undesirable because it results in the production of very inferior serum. It appears that, as a rule, and within certain limits, the longer the interval that elapses between immunization, on the one hand, and hyperimmunization, on the other, the more potent the serum. These results have been surprising in view of the success of Holmes in producing a highly potent anti-rinderpest serum by hyperimmunization at the "negative phase" within 10 days after immunization.

We have been unable to notice any marked physical signs of a "negative phase" following the simultaneous inoculation of susceptible pigs, provided, of course, a sufficient dose of serum is used. In some individuals there may be a transient rise of temperature a few days after inoculation, but nothing more if the work is properly done. Defibrinated blood from a pig affected with a virulent strain of hog cholera, such as was used in our experiments, is usually fatal to susceptible pigs when given in doses of 1/100 cc. or even less. The records show that we have been able regularly to administer from 50,000 to 100,000 times that dose to pigs within ten days after simultaneous inoculation without producing any marked reaction. To our minds, this seems to prove that there is no "negative phase" or stage of increased susceptibility to disease, following simultaneous inoculation against hog cholera, and that the state of increased susceptibility to immunizing response is not fully developed, as a rule, until the lapse of seven weeks or more after simultaneous inoculation.

Hyperimmunization With Diluted and Laked Virus Blood

As has been stated previously, Holmes reported that rinderpest virus diluted with hypotonic citrate solution was more satisfactory for hyperimmunization than the undiluted defibrinated blood. He believed this was due in part to the freeing of virus from the red blood cells through hemolysis and in part to the more rapid absorption of the diluted virus, the hyperimmunizing dose in anti-rinderpest serum production being given subcutaneously.

In anti-hog cholera serum production the hyperimmunizing dose is given intravenously, hence rapid dissemination even of the undiluted defibrinated blood is assured, but since there was a possibility that through hemolysis a greater amount of the antigen would be made immediately available, several immunes were hyperimmunized with diluted virus in order to compare serum produced in that way with serum secured by the common practice of injecting the undiluted defibrinated blood.

These experiments indicated that neither dilution nor hemolysis increases the antigenic properties of hog cholera virus blood to any material degree when injections are made intravenously.

Conclusions

1. In the production of anti-hog-cholera serum an interval of not less than seven weeks should be allowed to elapse between immunization and hyperimmunization. It is believed that the most uniformly satisfactory results will be obtained by allowing at least three months to elapse between immunization and hyperimmunization.

2. The ability of immune hogs to respond to hyperimmunization to the desired degree, once acquired, remains unimpaired for at least a year.

3. There is no evidence of a "negative phase" or state of hypersusceptibility to hog cholera following simultaneous inoculation.

4. Dilution and hemolysis of hog cholera virus blood do not materially increase its antigenic power.

Mutton sheep are as high as 68 per cent of the sheep in the South Atlantic and West North Central States, and as low as 32 per cent in the Western and Pacific States and 44 per cent in the South Central.

Ohio is by far the leading sheep state outside of the Western and Pacific group and has 3,000,000 sheep, about one-half of which are now mutton bloods, while 10 years ago the fraction was nearly two-fifths. —*U. S. Dept. of Agri.*

What We Have Learned About Biologic Products*

By H. JENSEN, M. D. C., Kansas City, Mo.

CONTAGIOUS abortion of cattle is of greater importance to the stock owner and dairyman than any other disease existing among cattle. Many thousands of abortion bacterin treatments have been used in this country during the past three years and a large percentage with what appears to be the most encouraging results. We receive many reports from the field where this product has been used in herds in which the number of abortions before treatment ranged from forty to eighty per cent. The loss after using the abortion bacterin treatment, in conjunction with sanitation and local disinfection of the uterus of the aborting animals, has been reduced to four and five per cent the following year. On the other hand, we receive reports that are not quite so encouraging, but in most of these instances the stock owner admits that his losses are less than the previous year but the results not those he anticipated. In most of these cases, upon investigation we find that the treatment was given very late in the stage of pregnancy, that local disinfection of the uterus before breeding had not been attended to, and sanitary measures had been neglected entirely, so that by placing the use of the product under the most unfavorable conditions we would not expect to obtain the best results.

Another disease of great importance to the cattle, sheep, swine and fowl raiser is hemorrhagic septicemia. The hemorrhagic septicemia bacterin when administered in sufficiently large dosage, should, and almost invariably does check the losses from this disease immediately, and its use in large doses as a curative agent has in many instances given very beneficial results.

One point that should be emphasized relative to this disease in cattle is that in some instances it occurs in conjunction with blackleg. We have found in our laboratories from material sent to us from the field, in some herds where the bacterin for hemorrhagic septicemia would not protect, that the blackleg organism was present in the circulating blood and upon vaccination with a potent blackleg product the losses stopped immediately. We do not wish to be understood as stating that all failures to protect the herd with one vaccination are due to complications with other diseases, for such is not the case, because we occasionally find an outbreak of such virulent type that two, three, and sometimes four vaccinations are necessary before the outbreak can be stopped, but we have never found this disease existing in a herd, of such virulence that it could not be eradicated if the owner would continue the vaccination. The use of hemorrhagic septicemia bacterin in the immunization of sheep against this disease has given gratifying results. These results have been of such a promising nature that in many states the agricultural colleges and other interested institutions have considered legislation compelling all owners to vaccinate sheep upon their entry into the state, and in this way they felt that the disease in sheep could be almost entirely eliminated.

Hemorrhagic Septicemia Rare in Swine

Hemorrhagic septicemia in swine in a pure, uncomplicated form is, in the opinion of the writer, a very rare disease, although we would hesitate to say that it does not occur at times as such, but we venture to make the statement that the largest percentage of specimens which we have received at our laboratories from the field for examination lead us to believe that the losses from complicated hemorrhagic septicemia in swine, otherwise known as mixed infection, are much greater than those from pure hemorrhagic septicemia. In a great many instances there appears to be confusing opinions as to the losses caused by hemorrhagic septicemia in swine and hog cholera. The pathological lesions in both diseases are identically the same, so that it is almost impossible for the veterinarian in the field to say definitely whether it is hog cholera or hemorrhagic septicemia alone or in combination with one another. There have been instances in which both diseases existed simultaneously, hence vaccination against one disease only did not prevent losses from the other. We have found this

*Presented at meeting of Mississippi State Veterinary Medical Association, Greenville, Feb. 4 and 5, 1919.

to be the case in a great many so-called "breaks" with hog cholera serum and virus. It was definitely proved that the animals were not suffering from hog cholera but from hemorrhagic septicemia or mixed infection. We have many times advised veterinarians to advocate vaccination against both hemorrhagic septicemia and hog cholera simultaneously. There is no reason why these two products should not both be administered at one operation and beneficial results obtained from each. We feel that by using this method a great many failures to immunize against hog cholera will be eliminated and also that extensive outbreaks of hemorrhagic septicemia will in many cases be prevented.

Poultry Branch Neglected

One branch of veterinary medicine which has been very sadly neglected, both in our educational institutions and among practicing veterinarians in the field, is the treatment of diseases in fowls. For a long time a disease known as fowl cholera has caused great losses in the poultry industry and a great many pharmaceutical preparations have been placed on the market, both for prevention and treatment. This disease has been extensively investigated from the standpoint of bacteriology and it has finally been proved and accepted by the Bureau of Animal Industry that the so-called fowl cholera is in reality hemorrhagic septicemia. A great many fowls have been immunized with hemorrhagic septicemia bacterin prepared from organisms isolated during outbreaks of the disease, and both the prophylactic and curative value of the product have been established beyond a doubt. This places the poultry industry on a better foundation and will encourage increased production to a great extent, because the owners now have a product with which they can immunize their fowls against the disease which has caused them great financial losses.

During the past eighteen to twenty-four months you have read and heard a great deal about blackleg and the various immunizing agents. During recent years we have learned many things about this disease, especially as regards immunization against it. The pill or powder form of blackleg vaccine has served its purpose. It has saved a great many animals in the past, but now it has come to be considered a very unreliable and unscientific product. In its preparation there were factors which could not be controlled, so that if a preparation was made of sufficient strength to provide immunity and protect the animal against natural infection, it was so strong as to set up the disease in a great many of the weaker individuals. On the other hand, if the product were made of such strength that it would not produce the disease, under any conditions, it did not produce sufficient immunity to protect against natural infection. For these reasons, new products have been developed which give far better results and the methods of preparation are of a more scientific nature, namely, germ-free natural aggressin, liquid blackleg vaccine and blackleg filtrate. None of these products is infallible, but in our experience natural aggressin and liquid blackleg vaccine have given the best results in the field. The percentages of failures to protect have been much lower than with blackleg filtrate. The losses which have occurred after the use of the natural aggressin or liquid blackleg vaccine have followed the administration of the product so closely, occurring usually on the third to the fifth day, that it was almost conclusive that the animals were already infected at the time of vaccination. It is impossible to infect an animal with natural aggression, because the product is entirely devoid of all organisms, containing nothing but the toxin of the blackleg germ in a suspension of body fluid. In a few instances liquid blackleg vaccine has been said to have produced the disease in healthy calves, but this does not seem possible, as very rigid tests are applied to the product before it is placed on the market. We have investigated most of these cases, and in all but two we could account for the losses following the vaccination, and the cause was the same in all instances. After losing one or two animals in a herd where there apparently had been no blackleg previously, we asked for specimens for laboratory diagnosis and found that the animals were suffering from hemorrhagic septicemia. At the site of injection of the blackleg vaccine we found a number of blackleg organisms and a slight discoloration of the muscle, but when we inoculated extracts of this muscle containing a large number of blackleg organisms into guinea pigs no blackleg was produced. We immediately advised the vaccination of these animals with

hemorrhagic septicemia bacterin, and in every instance the losses were stopped immediately. From investigation of these cases, we came to the conclusion that the deaths resulted from infection with the hemorrhagic septicemia organisms, the animals having been vaccinated with an attenuated form of the blackleg organism, the body resistance was lowered allowing the organisms to multiply sufficiently to produce a slight discoloration of the muscle but not sufficient to cause death.

Regarding the other two cases in which unsatisfactory results followed the use of the vaccine we were unable to trace the cause to any other complicating disease but finally came to the conclusion that the animals were hypersusceptible to blackleg infection and that in all probability the disease was produced by the injection of the vaccine.

It must not be inferred that we wish to discourage the use of liquid blackleg vaccine; on the contrary, we wish to encourage its use, because we feel that it produces a very high degree of immunity extending over a long period of time. The few bad reports which we have received from the use of this product in comparison to the many thousands of animals that have been vaccinated with liquid blackleg vaccine are so insignificant as to be negligible when the selection of a product is being made. The failures which have occurred following the use of blackleg filtrate have not been within the three-day period after vaccination. This product appears to produce immunity lasting in many instances about ninety days, the animals coming down with the disease at the expiration of that time, so that it is evident that the filtrate has not been of sufficient strength in the past to produce immunity for a long period of time. The use of this product should not be discouraged and far be it from us to discourage either the production or the use of it, for we firmly and sincerely believe that its production will be perfected so as to give definite and uniform results. We attribute the failure of this product to protect animals against blackleg to the handling of the toxin which is very sensitive to the action of the light, heat and air, deterioration taking place very rapidly when coming in contact with any of these elements.

Anthrax Vaccine

The most important disease to the southern veterinarian is anthrax, which has existed for years and has been given a great deal of study. The Pasteur anthrax vaccine was a very unreliable product, although it has proved very beneficial in the past. An improvement over the Pasteur vaccine is the double spore anthrax vaccine which is a more scientific product and has given more reliable and gratifying results in the field. The simultaneous anthrax treatment is giving good results, and from the scientific standpoint is the best method for immunization against this disease. By administering the immune serum and virus simultaneously, both active and passive immunity are produced. In this way the immune serum protects the animal against a virus of such virulence that in all probability when injected alone would produce the disease. By employing the simultaneous method both operations are accomplished at once and a higher grade of immunity is established from the use of this strong virus. We have heard of very few unfavorable results following the employment of this method and there is every evidence that the immunity established from this method of vaccination is of the very highest order. The curative value of anti-anthrax serum so far has not been as pronounced as the prophylactic, although it has apparently cured some cases of already developed anthrax, while on the other hand cases of anthrax have been treated with large quantities of this product with unsatisfactory results. The only explanation which we can offer for the failure of this product to cure already developed cases of anthrax is that in all probability the virus which was used in the immunization of the horses in producing this product was not of sufficient virulence to produce the high concentration of immune bodies in a given volume of the serum.

Anti-equine influenza bacterin has in most instances given good results both as a preventive and curative agent in this disease. We do not claim to treat the true and uncomplicated disease, for, in our opinion, true influenza is caused by a filtrable virus. Uncomplicated influenza appears in the horse about the same as rhinitis or a bad cold in man, and has not proved fatal in any cases reported. On the

other hand, the disease we call influenza is complicated with secondary invading organisms which usually cause a very high mortality, resulting in pneumonia, pleurisy or acute enteritis. These complications are caused by such organisms as streptococci, staphylococci, B. equisepticus and B. coli communis. It is against these last named organisms that we desire and do produce immunity against the fatal complications, and these are the only conditions against which we can protect an animal with a bacterin.

There has been a great deal of discussion as to the proper dosage and method of immunization to obtain the best results in combating this disease. Some desire small doses repeated at intervals of three to five days as a prophylactic while others use the large dose and give only one injection. Good results in the past should encourage the use of this product in the future. Of course, there have been instances in which the influenza bacterin did not appear to give sufficient protection and the animal came down with the disease in a mild form. According to the theories of immunization the large dose should be used as a prophylactic and the small repeated doses as a curative agent, but we have found in this disease, as in many others, that the practical use of bacterial vaccines does not always follow the theoretical hypothesis laid down for them. There are two avenues of administering this product, subcutaneously and intravenously. The former method has been used far more extensively than the latter, but we feel, and advise many of the veterinarians with whom we come in contact, that the intravenous route is the proper means of administration. Its advantage over the subcutaneous method is that by coming in contact immediately with the blood stream which carries the killed organisms to the various tissues of the body, it allows the same number of organisms to come in contact with a greater volume of tissue than when injected subcutaneously. Furthermore, the reaction which follows the administration of the product reaches its height in a much shorter period of time and subsides far more rapidly. When recommending the use of anti-influenza bacterin certain factors should be considered. First have these animals been exposed to the disease? If so, they should be considered as already infected and the dosage should be regulated the same as for treatment. If there is positive evidence that the animals have not been exposed and are not harboring the infection, the prophylactic treatment, which is the high dosage, may be used with gratifying results. In the treatment of this disease sanitary measures must not be neglected. The stable should be thoroughly disinfected and all stalls, mangers, feed boxes and water containers should be washed with a disinfectant and thoroughly cleansed. In this way the possibility of re-infection taking place during the period of immunization is eliminated.

Polyvalent mixed bacterin has been very extensively used in the past and has given very good results in the treatment of fistulæ, poll-evil, quittor and infected wounds of all kinds. When mixed bacterin was first used, practitioners believed that the administration of the product was all that was necessary to obtain curative results, but it has been found that to obtain the best results other methods should be employed as adjuncts. In fistulæ one cannot expect to leave the pockets of pus present in the tissues without drainage and expect it to be re-absorbed, by treating the animal with mixed bacterin. It was never intended for this purpose. The pocket of pus should be given proper drainage and local antiseptic treatment to assist the action of the bacterin. In all cases where pus is present surgical cleanliness and disinfection should be instituted in conjunction with the bacterin treatment.

Space and time forbid presentation. of data on the results of the various products. An attempt has been made to point out the most salient features that should be strictly observed in the use of biological products to obtain the best results. There are many other products of great importance but a complete report of all the biological products in the field today is not feasible, those products being selected for discussion which have been used most extensively by veterinarians in various sections of this country. We have shown both our good and questionable results as reported to us. It is our endeavor to follow the results obtained from the use of the various biological products so that we may be in a position to assist the veterinary profession in combating the diseases of domestic animals.

The Reliability and Personnel of Anti-Hog Cholera Serum Producers

By Geo. I. BLANCHARD, D. V. S., Kansas City, Mo.

TO one who has been engaged in the production of anti-hog cholera serum since it first came to the notice of the profession as a commercial product, it has been interesting to note the gradual but rapid development of the industry from the haphazard money-making jumble of a few years ago to the definite business proposition of today. Most fascinating, perhaps, has been the sifting out of the positive elements of value in serum in the protection of swine against cholera and the discrimination of the veterinary practitioner in eliminating the negative phases which caused so much confusion in the early days of serum usage. No other field of medical research has shown the wonderful progress of serum production and administration. This speaks well for the ability and perseverance of the veterinary profession in following up discoveries promising a greater conservation of meat supplies.

No small factor in the development of the serum industry is the supervision of serum manufacture by the federal government. The chief value of the work of the Bureau of Animal Industry in relation to serum production lies not so much in the insurance against an impotent product, as in the stimulus to the producer himself to study conditions in search of better methods of manufacture and higher potency. It will be recalled that serum, good potent serum, was made before government inspection was inaugurated, under conditions which no enlightened veterinarian and few laymen would sanction now. Much good is accomplished by federal inspection. As a matter of fact, any governmental regulation of business cannot be expected to control absolutely untoward practices, else there would be no occasion for all the maze of legal procedure in which business and individuals are constantly involved. It must be borne in mind that a good law helps the law-abiding citizen in being a good citizen more than it prevents the bad fellow from committing crime.

In relation to serum inspection, every producer will declare there are some regulations which are unjust, some which are irrational, and some which are simply nonsensical, but it would be difficult to find a producer who would favor the removal of inspection entirely, notwithstanding he may thereby be able to make greater profit from his operations. Experience has demonstrated that time will remove all regulations which are rightfully objectionable, and that the Department is imbued always with the one idea of protecting the serum user even though an occasional regulation may seem to be a mistake.

To the user of serum and virus, the government license number on the label signifies that the product was produced under conditions which protected it from contamination and that it stood the test of producing immunity in 20 c.c. doses against 2 c.c. of virus. It is possible to cheat the government inspection, it is true, as was brought out recently in a case in which a "wild-cat" producer and jobber purchased a small quantity of licensed serum to which he added bottles of his own product, bearing labels identical to those on the legitimate serum. All were marketed interstate through another jobber. Fortunately, a severe break caused the whole proposition to become exposed. While situations of this type are possible, and do sometimes occur, no producer of any standing, if inclined to do so, would care to run the risk of condemnation by the Bureau, in trying to circumvent any of the regulations.

Producer Invites Inspection

As a matter of fact, the U. S. Licensed serum producer is more interested than the Bureau in having his product highly potent and free from any undesirable properties, for he has found it less expensive to pour a batch of serum into the sewer than to explain and adjust unpleasant breaks. That potent anti-hog cholera serum injected simultaneously with live hog cholera virus into susceptible but healthy hogs, will prevent cholera, is a positive fact. In this there is no basis for difference of opinion nor debate, hence the serum producer is eagerly anxious that the

user of his product shall never be able to question its potency. The profession, as a rule, recognizes this and every possible explanation of a break is exhausted before the practitioner is willing to suspect the serum.

Unfortunately, conditions early in the history of serum production warranted the establishment of a practice among serum manufacturers of supplying serum for re-immunization without investigation to determine whether conditions justified it. This practice tended to make the serum user careless in technic of administration, to the end that there was created a prejudice against serum which it has been difficult to overcome. In latter years, the manufacturer has found it advantageous to make personal investigation of all reported outbreaks, not that he saved financial loss, but because such an attitude made the serum user more alert to get desired results in the initial immunization.

Much has been said pro and con on the subject of restriction of virus to veterinary usage, and in this relation one or two citations might be suggestive. In the states of Iowa and Missouri in 1918, where the immunization of swine was largely in the hands of veterinarians, the losses in swine from all causes was considerably smaller than in Nebraska, where immunization was almost entirely done by laymen, and in Kansas, where much of the immunization is by laymen. The serum producer recognizes the significance of this and would desire that all immunization be carried out by veterinarians, but in this he has no choice for the veterinarian himself will not support such an arrangement.

An important fact is often overlooked by the public and the profession, that the serum industry is a vital factor in the production and saving of the marketable supply of hogs. There are few veterinarians too young to recall the time when hog-raising was so uncertain that most farmers hesitated to put much money into swine. A commonly quoted axiom directed at the swine-raiser was, "The cholera will get him if he stays in the business long enough." Contrast this with the report that the state of Iowa raised and marketed over five million hogs last year. Serum has made the hog industry safe. In the multiplication of swine, the serum producer is vitally interested, for a profitable swine industry is essential to his business. The effort expended by serum manufacturers in encouraging hog-raising is scarcely appreciated, and yet a large part of his energy is directed along that line.

Improved Production Aim of Producer

Within the past few years the producers of serum have recognized the value of exchanging ideas and ways and means of improving production. It has been discovered that mutual help along the line of improved equipment, methods of manufacture, and distribution, is helpful in placing the serum industry upon a stable basis. The large producers have offered a helping hand to the little fellows and to one another. This has been particularly true in putting an end to practices calculated to discredit serum in the eyes of the public. Within the past year a whole state has been opened to competitive serum sales where formerly all serum was sold through one man. In another instance, a law made to serve the coffers of certain interests to the disadvantage of the serum user, has been tested in the courts.

The Associated Serum Companies of America is an organization of licensed serum producers for the purpose of perfecting the serum industry along scientific lines and of distributing information looking to the protection and conservation of the swine industry. The organization, through its individual members and its officers, stands ready at any time to participate financially, morally, or actively in any worthy undertaking calculated to increase the quality or quantity of hog production. The association invites from the profession, criticisms or suggestions looking to improvement of the serum or the swine industry, and will be glad always to give any aid possible in solving the problems of the veterinarian in handling swine diseases.

To the veterinary profession the association expresses its full confidence, promises its entire co-operation, and solicits a closer relationship and understanding.

WANTS CHEAP BUT EFFECTIVE CASTING HARNESS

I would like to see in the Journal a description of a cheap yet effective casting harness—one in which all four feet are engaged when the animal is ready to be operated upon. I would prefer one entirely of rope. Will not some brother practitioner proffer the desired information?—E. T. F., Minn.

Purpura Hemorrhagica Following Influenza*

By J. C. RASMUSSEN, Wyanet, Ill.

THIS disease was formerly grouped among the putrid fevers, and was known as typhus or typhoid fever, because of its supposed identity with these diseases, and was thought to be essentially a primary decomposition of the blood. Later it was considered by some to be a form of anthrax, by others an affection related to scarlet fever in man. In 1841, Hering recognized its non-infectious nature and at the same time separated the disease as an independent affection from other similar ailments and called it petechial fever. In France and Italy it was looked upon by some authorities, and is regarded even at the present time by Trasbot and others, as acute anasarca, and was traced, not to decomposition of the blood, but to great and temporary paralysis of the capillaries and effusion of serum and blood.

Recently the idea gained general acceptance that the disease is an intoxication caused by bacterial toxins. The names given at the present time to the disease, purpura hemorrhagica, petechial fever and anasarca, are based upon important symptoms, particularly the hemorrhages into the mucous membranes. The designation of horse typhus, which was used in former times, does not appear to be appropriate, as the disease differs decidedly from typhus affections of man.

Purpura hemorrhagica usually occurs sporadically, but many cases may appear within a short time, especially in stables where influenza has existed. The disease is of importance on one hand because of its frequently fatal termination, and on the other hand because of its very slow course and the loss sustained by the continued disability of the patient for work.

Purpura hemorrhagica, with rare exceptions, develops as a secondary affection, as a sequel to diseases in which suppuration or necrosis of tissue have occurred in any part of the body. Such diseases are especially, influenza, strangles, pneumonia, pharyngitis, in rare cases of catarrh of the upper air passages or of the intestines and pyemia of the sinuses of the head, caries of bone, abscesses from any cause, and gangrenous areas in the subcutaneous connective tissue or in the internal organs. As all of these diseases are associated with the presence of micro-organisms, and as the purpura hemorrhagica sometimes occurs in the form of an enzootic, it may be accepted that micro-organisms are either directly or indirectly associated with the development of the disease. The indirect influence of the microbes in the appearance of the disease, is substantiated by the fact that the affection is not transmitted from infected to healthy animals, and cannot be transmitted artificially either by inoculation of secretions from the affected animals, or with blood, nor by direct transfusions of blood.

The characteristic hemorrhages and serous exudations in the disease indicate a severe affection of the vessel walls, which in all probability may be explained by the fact that chemical substances which circulate in the blood reduce the normal elasticity and resistance of the vessel walls.

While this may be the result of a change in the blood, through which the nutrition of the walls of the vessel becomes diminished, and the watery consistency of the blood in itself facilitates the transudation of the blood plasma, a direct toxic action appears much more probable in consideration of the quick, sometimes very abrupt hemorrhages and serous infiltrations.

Since, according to observations, pathogenic bacteria produce toxic substances, poison of similar origin may be suspected as the etiological factor of this disease. Since purpura hemorrhagica with rare exceptions develops as a sequel to diseases in which suppuration or necrosis of tissue have occurred in any part of the body, is it not very probable, as the diseases preceding purpura hemorrhagica, as a rule, are those in which the abscesses or gangrenous areas which develop in the course of the disease, communicate either originally or later with the outside world, that the route is thus provided whereby micro-organisms may readily gain entrance to the body? These organisms may then multiply in the exudate or the necrotic tissues, and produce chemical poisons which are later absorbed by the circulation.

*Read at Ill. V. M. A. Meeting, Chicago, Dec., 1918.

Characteristic Lesions

The characteristic lesions of the disease are hemorrhages in the skin and in the mucous membranes as well as in the subcutaneous and submucous connective tissue, in association with extensive, very marked, edematous swellings. Inflammation and tissue necrosis may develop as secondary processes with swelling of the affected parts of the body.

In these edematous swellings the subcutaneous tissue forms a yellow, gelatinous infiltration, which may involve some of the deeper structures beneath the skin, even the muscles.

The affected muscles feel greasy to the touch, and are generally sprinkled with small hemorrhages.

These hemorrhages may also occur in the tendons and tendon sheaths, under the periosteum or in the joints, in some of the internal organs, especially in the lungs and spleen, and under the capsule of the liver and kidneys, the heart muscle and under the pericardium. Of the mucous membranes, those of the nose, conjunctiva, pharynx and larynx become affected first, then those of the stomach and the small intestines.

Among the early indications of purpura hemorrhagica is the appearance of numerous dark red petechial spots in the nasal mucous membranes. They are sometimes as small as a flea bite, but generally from one-quarter to three-quarters of an inch in diameter, frequently mingling and forming large blotches or streaks.

In very severe cases the mucous membranes become gangrenous and covered with ulcers, and the expired air has a very fetid odor.

Over the larger extravasations the mucous membranes are often necrotic, or after the pale yellow necrotic parts have been thrown off, irregularly formed ulcerations covered with dirty tissue shreds develop.

These necrotic areas may be found upon the intestinal wall and there is a possibility of perforating the wall, which might lead to peritonitis, while in the nose the ulcerative process may cause a destruction of the nasal septum. In the meantime swelling of the eyelids is frequently observed, and if they are forcibly spread apart a bloody fluid or even pure blood escapes.

In some instances the animals do not manifest any indications of disturbed health, while in other cases the appetite becomes somewhat diminished in the earlier stages, and the patient manifests slight dullness and depression.

Immediately after the appearance of the hemorrhages in the nasal mucous membranes, swellings of the skin and the subcutaneous connective tissue make their appearance, often being the first symptom observed, on account of their being more readily seen than the blood spots. These diffuse swellings develop on the extremities, on the chest and the lower part of the abdomen, especially on the sheath and udder, and in some cases are present all over the body.

These swellings at first vary in size from an apple to a man's fist, and resemble carbuncles; again they often grow rapidly, assuming great dimensions, which greatly disfigure the attacked parts.

In severe cases the circumference of the extremities from the coronary band to the elbow and stifle becomes enormous, two to three times the normal size.

The rapid and simultaneous appearance of swellings on several parts of the body is characteristic of this disease. The swellings are always sharply defined from the healthy surrounding parts and upon pressure are found to be very firm and painful.

Usually a yellowish tenacious serous fluid oozes out which later dries, forming a brown crust. Swelling of the limbs renders the gait very awkward, prevents the animal from lying down and getting up, and gives rise to evidences of pain when the limbs are being bent, making it impossible for the horse to be moved from the spot he occupies.

When the lower part of the head is considerably swollen, the openings of the nostrils become proportionately narrowed, and sometimes even completely closed, with the result of excessive wheezing, and breathing and finally suffocation, unless the condition is relieved quickly. At the beginning of the attack, food may be eaten fairly well for several days; later on, mastication often becomes difficult and finally impossible by swelling of the lips and cheeks.

With the appearance of fever, the appetite becomes disturbed and constipation sets in. Swallowing is frequently prevented by grave implication of the pharynx, on the mucous membranes of

which, petechial and edematous swelling of the submucosa appear with the formation of ulcers and inflammation of the retropharyngeal lymph glands.

Complications

Purpura hemorrhagica is complicated with symptoms of pharyngitis, such as difficulty in swallowing, salivation, regurgitation, wedging of the food between the teeth and the walls of the cheek, continued extension of the head and neck and bad odors from the mouth. A very unfavorable complication is the appearance of colicky pains, which are usually of an intermittent nature, possibly due to hemorrhages into the intestinal mucous membranes. In this case the feces may be tinted with blood. The urine may contain albumen and also blood.

In mild cases there is very little rise of temperature; the heart action may be sufficiently strong, but as the disease progresses the temperature rises and the heart action becomes very rapid and throbbing, while the pulse steadily diminishes in volume.

In caring for cases of purpura hemorrhagica a roomy loose box stall should be provided in which the animal can freely move about.

The head stall should be removed and a liberal amount of pure fresh air, green feed, mashes and good clean drinking water provided.

Wounds, ulcers and abscesses require antiseptic surgical treatment. The nasal cavities should be carefully syringed out two or three times a day with a non-irritating antiseptic or disinfecting solution, such as a two to four per cent solution of boric acid, creolin or lysol.

Gangrene of the swellings of the skin in many cases may be retarded by rubbing with spirits of turpentine two or three times daily. Counter-irritation should never be used on the swellings of the skin in cases of purpura hemorrhagica, as it generally promotes necrosis of the susceptible skin.

Very little benefit seems to be derived from local treatment of the cutaneous swellings with astringents. Favorable results may be secured by the use of pure oil or ointments to lessen the tension of the swellings.

While conjunctivitis may be controlled by a five per cent solution of boric acid or by blowing sodium borate into the eye, if the patient is threatened with asphyxiation as the result of marked constriction of the upper air passages, insertion of the tracheotomy tube is advisable as a last resort. The wound and the tracheotomy tube should be cleaned two or three times a day with any of the above antiseptic solutions.

Remedies used in the treatment of purpura hemorrhagica should be well diluted so as to prevent undue irritation of the mucous membranes of the alimentary canal. The oils are preferred as laxatives in these cases.

Calomel not only has a disinfecting action, but also facilitates the absorption of the transudated serous fluid as a result of its uniting with the blood albumen, three to four grams daily. Ichthyol, cinchona bark, potassium bichromate, tincture ferric chloride, turpentine, etc., have been used with doubtful results.

Lugol's solution and potassium iodid have been given a very extensive trial in the hands of some men, with favorable results. Very favorable results also have been obtained by various practitioners with the serum treatment. Of late years, calomel, linseed oil and potassium iodid and the polyvalent bacterins have given me the most favorable results.

Animals convalescing should receive plenty of fresh air and some exercise according to the condition of the animal and good nourishing food, as well as good tonics and good grooming.

Discussion

DR C. C. MILLS: Have you had particularly good results from the use of bacterins?

DR. RASMUSSEN: I have used mostly the mixed bacterins. They give better results, but they have not been entirely satisfactory.

DR. L. C. TIFFANY: The doctor says turpentine and tincture of iron chloride were used with doubtful results. We were taught that turpentine and plenty of air in connection with linseed oil was a very successful treatment, and since I have been in practice, I have continued to use it and have found it successful in large doses. In one case in particular, where I was called in consultation, the animal's head was swelled badly and doubtless death would have been certain within a few hours. The attending veterinarian gave him potassium dichromate without benefit. As I remember it, we gave six ounces of turpentine every two or three hours. The horse recovered. If it was good treatment then it

should be good treatment now. As turpentine is a stimulant, and also an antiseptic and a parasiticide, it probably had the effect of stopping the spread of the infection.

DR. QUITMAN: I congratulate Dr. Rasmussen on starting a discussion on good old horse diseases. In our meetings of late years, we have heard so little concerning the horse, one would think he had almost become extinct.

I think it has been a good many years since Dr. Tiffany treated that case. If the horse took that much turpentine, in my opinion, he could have stood almost anything, because that dose is almost a fatal one. It is a dose that would seem to destroy any vestige of appetite the horse might have. However, with reference to the effect on the kidneys, there would be less danger of nephritis from a six-ounce dose than from a one-ounce dose repeated for some time. That is the only advantage that a large dose offers; the entire effect seems to be expended on the gastro-intestinal mechanism and it does not act as a diuretic. In a case of purpura hemorrhagica, where it is repeated every four hours, only a very small dose of turpentine should be given, two or three drams. This produces the desired effect and the proper stimulus on the arteries and on the urinary apparatus. The treatment Dr. Tiffany mentioned, I started out to use in my early days in practice. The popular treatment in those days was turpentine, tincture of iron chlorid and linseed oil. Under this treatment it is true many recoveries occurred, but the mortality was easily forty per cent. Furthermore, it took the animals six to seven and sometimes eight weeks to recover. Now, if a case does not get well within two or three weeks even after a very severe attack, the veterinarian is considered amiss in his treatment. It also follows that 90 per cent of the cases are being saved today.

Dr. Rasmussen's paper, excellent in the main, omitted one very important warning, which should be issued to the owner. He will insist upon exercising the horse frequently, and he should be warned emphatically against such action on the first visit. The horse must not be forced to exercise. It is all right to put him in a roomy stall, but he will not exercise any more than he is obliged to. Exercise is dangerous because it takes only a very little of it to drive the edema, or hemorrhages if you wish to call them such, from the limbs, floor of chest and abdomen, where it is doing no harm, to the internal organs, and death usually results. Enforced exercise often results in edema of the lungs, heart or liver. That is a very, very important point and failure to mention it to the owner may result in the loss of the animal.

I agree with Dr. Rasmussen that treatment of the head swellings is of practically no avail, yet these swellings can be relieved. Some advise hot water bathing, some cold water, some astringent lotions and so on. If the case is seen before the head swells, the head can be kept perfectly clean, but if the swelling has already taken place it can be relieved. A temporary hay rack should be placed so that the animal must reach up for his hay. It is a peculiar fact in these cases that while the patient may be unable to eat because of the mouth being swollen, by having a rack put up, not uncomfortably high, but so that the animal reaches the lower third, if he is inclined to eat, and he usually is, the slight raising of the head either prevents or relieves the swelling. Show the owner where you want the lowermost part of the hay rack. A temporary feed box for his grain and mash may also have to be made, and it should be placed higher than the ordinary feed box—just high enough so he can eat from it without rubbing the lower jaw bone. This will relieve the swelling. In cases of extreme swelling where the horse feels too miserable to reach up for his hay, the next best thing to do is to grasp the halter and elevate the head for five or ten minutes, lowering it when the animal becomes somewhat tired. The swelling may be relieved by this method.

The administration of active purgatives is contra-indicated in these cases; four ounces of linseed oil or liquid petrolatum may be given if necessary every four hours. Treatment of the nostrils, as referred to, is excellent from the standpoint of cleanliness.

In typical cases where the nostrils are so swollen as to make breathing difficult, sodium cacodylate should be given. I hesitate to mention that drug because of the frequency with which I have brought it to the notice of this association. This drug acts most quickly and beneficially in this disease. The use of Lugol's solution, intratracheally, while highly valuable, has its disadvantages in that repeated puncture by the hypodermic needle is apt to cause swelling and it may progress to such an extent as to interfere with the animal's breathing. Again, not infrequently, repeated puncturing will be followed by sloughing. That is my objection to the intratracheal treatment of this disease by Lugol's solution, but aside from these objections, with the dichromate of potassium and tincture chlorid of iron treatment, where it can be administered, and that is in 95 per cent of the cases, will bring these cases through inside of two or three weeks. In severe cases the sodium cacodylate may be used alone or in conjunction with dichromate of potassium and iron. As a rule I let the bowels alone except in rare cases. If the animal can eat, the bowels can be relieved by bran mash, and I think that better than the administration of laxatives or purgatives.

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The Camouflage is Discarded

AT a meeting of the Federation of Veterinary Colleges of North America (private schools) held in Chicago recently, the association with a single dissenting vote (Indiana) decided not to maintain the entrance requirements adopted by the A. V. M. A. for accredited veterinary colleges and to adhere to the standard required by the B. A. I. for colleges whose graduates will be accepted for examinations for the position of veterinary inspector in the federal service. In effect, the action was to tell the A. V. M. A. to "go to," an action that has been threatened often in the past, but always defeated through the efforts of the late Dr. S. Stewart, of Kansas City.

It were idle, even asinine, to say there have been no good private veterinary colleges, or no poor state veterinary colleges, or to make the reverse of this statement. Probably no one possesses the information upon which to properly classify all of the veterinary colleges in this country, certainly the editor does not possess this information; but he does know of both state and private veterinary colleges that are good schools and of both state and private veterinary schools that are unworthy of recognition.

The A. V. M. A. in the past has failed to differentiate between the good, mediocre and the worthless veterinary schools. It set a standard, never too high, that accredited schools should attain and then year after year placed all schools in the accredited list, accepting the claims in the catalogs of these schools as to the standard maintained, rather than the result of its own investigating committees, which had to be satisfied with slapping the unsatisfactory schools gently on the wrist, and always in private. The fact is, the investigating committee usually took these schools into a dark closet to administer the punishment, and no outsider, except the secretary of the association, who was obligated to secrecy, was permitted to see a record of it.

This policy has kept a large percentage of the veterinary colleges of the country on the accredited list (until very recently all of them), but it has worked an injustice to the schools that made a genuine attempt to maintain the standard set by the A. V. M. A. and succeeded. On the other hand, this policy benefited the schools that made no attempt to attain the A. V. M. A. standard, except in the claims in their catalogs, since it enabled them to compete on equal terms with schools maintaining a better and far more expensive equipment and course of instruction. The private schools have simplified these measures now for the A. V. M. A. They are not going to claim in their catalogs to meet the A. V. M. A. requirements. At least some of them are not. Since the standard set by the A. V. M. A. for matriculation, the completion of a four-year-high-school course, beginning with the school year of 1919-1920, is a part of its constitution and by-laws, and since it requires two meetings of the association to change this provision of its by-laws, it seems highly unlikely that schools definitely proclaiming a lower

standard can be continued on the accredited list. How the association can back up in this as it did at the Indianapolis meeting, and at the New York meeting following, in the matter of the standard proclaimed at the Toronto meeting is not apparent.

When a number of the private veterinary schools are off the accredited list, and it seems inevitable that some will be dropped from the list at the New Orleans meeting, it is quite possible that their influence in the A. V. M. A. will be exerted to see that those schools, state or private, that are maintained on the accredited list meet the requirements in fact as well as in their catalogs, and thus we may get some real classification. The effect will be most wholesome if we do.

It is believed by the schools that have decided to ignore the A. V. M. A., that its influence will not be of particular moment to them. In this, we think they are wrong. Being flouted may galvanize the association into action. Its size, its extent and its standing is such that we believe it can, if it will, force the discontinuance of any school that meets with its disapproval.

To begin with, the A. V. M. A. can probably wield a determining influence with the Bureau of Animal Industry. It is pretty well understood that those responsible for the policy of the B. A. I. look with favor upon the A. V. M. A. standard for entrance requirements and that a little well directed effort to this end would bring about the adoption of the A. V. M. A. standard for schools whose graduates are admitted to civil service examinations for veterinary positions in the United States Department of Agriculture, including, of course, the position of veterinary inspector in the B. A. I. If the graduates of a school not maintaining the A. V. M. A. standard were shut out from employment in the B. A. I., the battle for the annihilation of such schools would be half won. It only remains to win the support of the various state veterinary examining boards. Had graduates of these schools no place to practice and no chance for service in the B. A. I., the schools could not continue to exist. The support of the examining boards for the A. V. M. A. requirements will not be difficult to obtain. One might almost say that no effort will be required to secure the cooperation of the boards of Minnesota, Iowa, California, Illinois, New York, Pennsylvania and Ohio and perhaps of other states.

Low entrance requirements and inadequate instruction is not popular with veterinarians in practice regardless of the standard of the school from which they may have been graduated. This may be, as has been charged, a "dog in the manger" attitude on the part of the practitioner or it may be a genuine concern for the protection of the live stock industry, but be the reason what it may, the fact is the practitioner is not favorable to the easy portal through which other veterinarians may be sent into his particular field. State veterinary examining boards reflect the sentiment of the veterinarians in their states. Where the number of veterinarians in a state is somewhere nearly adequate for the needs of that state, we may expect to find the examining board favorable to a high standard for those in the future to be admitted to examination or licensed to practice. This will bring the B. A. I. to the A. V. M. A. standard, if it does not see the light sooner, as it probably will. The bureau veterinarians will not tolerate a condition under which veterinarians of educational standards lower than those required for practitioners are accepted for federal service. Such a condition would be practically equivalent to public admission that the ability necessary for a veterinary practitioner was greater than that required for service in the B. A. I. Such an admission will not be made. The single standard and that the highest, is inevitable.

We believe the schools that fail to adopt the A. V. M. A. standard are making a mistake in judgment, and following a short-sighted policy; but we commend their honesty.

The Indiana Veterinary College authorities have notified the secretary of the A. V. M. A., offically, that they will maintain the A. V. M. A. standard. The Chicago Veterinary College, it is reported unofficially, will maintain the same standard.

Cholera "Cures" Fail

THE Indiana Agricultural Experiment Station has issued a bulletin recently that will undoubtedly be the means of saving the swine raisers of the state a great deal of loss.

In compliance with the provisions of the swine disease law of the state, the veterinary department of the experiment station has tested twenty preparations advertised and sold in the state for the prevention or cure of hog cholera.

The tests were thorough and the results should be convincing to hog raisers, even in the face of the statements of oily salesmen of the products found worthless. Veterinarians of other states can doubtless obtain copies of this bulletin for their clients or for local papers when any of the preparations that were tested are being marketed in their communities.

The following are the preparations tested and the findings:

"National 23," sold by the National Breeders' Company, Cleveland, Ohio. The preparation had no value as a hog cholera preventive or cure.

"U. S. Specific," produced by the U. S. Specific Company, Indianapolis, Indiana. The preparation was of no value in curing or preventing hog cholera.

"American Specific No. 2," produced by the American Specific Company, Elgin, Illinois. It possessed no curative or preventive properties against hog cholera.

"Blue Moon Hog Corrector," produced by the Blue Moon Stock Corrector Company, Crawfordsville, Indiana. This preparation was of no value in curing or preventing hog cholera.

A hog cholera preparation prepared by S. H. Colbert of Wheatland, Indiana. The test proved the material to be of no value as a hog cholera cure or preventive.

"Crosier's Hog Cholera Cure," manufactured by the Crosier's Stock & Poultry Company, New Albany, Indiana. The result of the test showed the remedy to be without value in curing or preventing hog cholera.

"Vaxall," prepared by Drs. Parrett and Montoux of Indianapolis, Indiana. It was not a remedy or preventive for hog cholera.

A preparation produced and sold by A. J. Keubler, Mt. Vernon, Indiana. It was without value as a cure or preventive for hog cholera.

The preparation known as "544," produced by the Thiele Laboratories, Columbus, Ohio. Tests showed the material to be without value as a hog cholera cure or preventive.

"Porcine," produced by the Porcine Remedy Company, Marion, Ohio. It was shown to be without value as a cure or preventive for hog cholera.

"Dobry Hog Remedy," manufactured by the John Dobry Manufacturing Company, Cedar Rapids, Iowa. It was not a cure or preventive for hog cholera.

"Perry's Swine Elixir," manufactured by the Swine Elixir Mfg. Co., Moultrie, Georgia. This preparation was found to be without value as a remedy for hog cholera.

"Puritan Tablets," recommended by John G. Taylor, Hotel DeSoto, New Orleans, La. The test proved that hog cholera cannot be cured by using this preparation.

"Cal-Sino Hog Restorative," manufactured by the Cal-Sino Company, Inc., Baltimore, Md. The test showed this remedy to be worthless as a cure for hog cholera.

"Bourbon Remedy," manufactured by the Bourbon Remedy Company, Lexington, Kentucky. This medicinal preparation was found to be neither a cure nor preventive for hog cholera.

"Posalti," recommended by Frank J. Cosgrove, South Bend, Indiana. It was shown to be neither a cure nor preventive for hog cholera.

A preparation put up by H. W. Metzler, Champaign, Illinois. This remedy was without value in treating pigs affected with the cholera or preventing the disease.

"Kol-Kur," produced by Chas. Billingsley, Princeton, Indiana. It was shown to be without value in curing or preventing hog cholera.

A preparation prepared by Mrs. Harry Condit, Vincennes, Indiana. The test showed the remedy to be without merit as a cure or preventive for hog cholera.

"Cholerine," manufactured by A. S. Horowitz Chemical Company, 17 E. 38th St., New York City. Test showed it to

be without value as a cure or preventive for hog cholera.

"Cunningham Hog Cholera Remedy." This preparation was shown to be without value as a cure or preventive for hog cholera.

The general plan of testing medicinal mixtures and other preparations advertised or sold as preventives and cures for hog cholera, was as follows: from five to 29 hogs, weighing from 60 to 100 pounds, were used for testing each of the remedies. All of the hogs were exposed to hog cholera by inoculating them with hog cholera blood, or placing them in a cholera infected pen. Part of the hogs were treated with the preparation according to the directions, and the balance were not treated. Daily observations of the conditions, symptoms, and body temperatures of the test lot were made. All were given the same feed and care. The manufacturer of the preparation cooperated with the station in a number of instances.

These facts emphasize the importance of having the exposed or infected herds promptly given the serum-simultaneous method of vaccination by trained veterinarians using high grade serum, rather than to lose time and money experimenting with a so-called medicinal hog cholera remedy or cure.

Army Veterinary Corps Miscellany

VETERINARY TRAINING SCHOOLS

THE veterinary corps organized three training schools for its personnel during this war—one for enlisted men at the Medical Officers' Training Camp, Fort Riley, Kan.; one for officers at Camp Greenleaf, Ga.; where enlisted men were also trained, and one for organizing, equipping and training of veterinary units for overseas service at Camp Lee, Va.

The school at Fort Riley, Kan., was established February 4, 1918, by Major Robert J. Foster, V. C. At that time authority had been given to allow men to enlist in the veterinary corps who were under and over the draft age. Practically all men who enlisted west of the Mississippi River were sent to Fort Riley for training. This school was in operation from February until September, 1918, and 540 men were trained, most of whom were sent to Camp Lee for overseas service.

The school at Camp Greenleaf was established by Major D. S. White (later Colonel), and it was contemplated to train there both officers and enlisted men. Major W. J. Stokes, V. C., assumed command of this school in March. At the time the armistice was signed, about 200 enlisted men had been trained; approximately 490 officers had been graduated; 240 officers were in training, and 655 enlisted Medical Reserve Corps men (graduate veterinarians) had reported for duty, of whom 86 had been commissioned and the rest were candidates for commissions.

The training school at Camp Lee, Va., was organized in April, 1918, with the purpose in view of organizing, equipping and training oversea units.

The fact must be borne in mind that the veterinary corps as a military organization was entirely new and was developed during the stress of war days, when haste meant everything. Everybody had to go forward, not backward, and if mistakes were made, there was no time to stop, but to move on with definite objects in view.

From the beginning of the Camp Lee school it was called upon to exceed its estimated capacity to send units overseas. The object of this school, as has been stated, was to organize, equip and train veterinary units for overseas service. At the time the armistice was signed, there was a schedule prepared for the shipment of overseas units to include June 30, 1919.

The veterinary corps had to provide officers for these units and had to have a constant supply to officer the units to be organized as fast as men were supplied from the draft. There was not an abundance of veterinary officers to fill this want. It was also found necessary to send officers overseas with either hospital or replacement units only.

The demand made for veterinary units by the War Department was of course known to the Veterinary Division, Surgeon General's office, and on this plan the organization of units was worked out. To some officers it might have seemed a waste of time to be kept at Camp Lee and not be sent overseas immediately, but the pleasure of a few individuals could not

be considered when it involved schedules affecting thousands of men.

It must also be kept in mind that the veterinary corps prior to the war consisted of less than 75 officers who had seen service in line organizations. Then, these officers had never had any regular military training. It was only what each individual had picked up for himself that marked his ability in purely military affairs. Many of these officers had been sent overseas and were not available for assignment to this school. When the establishment of the school was authorized by the General Staff, it was decided that it would be necessary to send line officers to the school as instructors until such time as the veterinary corps could supply the necessary trained officers. There was no other alternative.

Lieut. Colonel Gerald E. Griffin, V. C., was probably the most experienced man in the regular army veterinary corps, and he was made senior instructor, with the idea of his eventually being made Commandant. Veterinary officers were placed as understudies to other line officers on duty, and, had the school not been broken up by the armistice, all line officers would undoubtedly have been relieved shortly and their places taken by the veterinary officers acting as understudies.

The Camp Lee Veterinary Training School was in active operation from April 12, 1918, to November 11, 1918, and during that time a total of 393 officers and 7,968 enlisted men passed through the school. There were organized, equipped, trained and sent to France 15 veterinary hospitals (Nos. 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20 and 21), each consisting of 7 veterinary officers and 300 enlisted men; 1 base veterinary hospital of 4 officers and 144 enlisted men; 6 Corps Mobile Veterinary Hospitals of 2 officers and 35 enlisted men each; 3 Army Mobile Veterinary Hospitals of 4 officers and 144 men each, and 4 Veterinary Replacement Units of 13 officers and 200 men each.

There were organized, equipped and trained ready for oversea service when the signing of the armistice caused all shipments to stop, 3 veterinary hospitals, one base veterinary hospital, one corps mobile veterinary hospital, with personnel similar to units above mentioned, and one veterinary replacement unit, consisting of 40 officers and 200 men. There were also in process of organization at this time, but not completed, 5 veterinary hospitals, 5 corps mobile veterinary hospitals and 2 veterinary replacement units. Starting with absolutely nothing—not even a building—this record is not to be despised, even though a few individuals were not pleased. There was time only, under this extreme emergency, to consider units, organizations and results obtained as a whole and not by individuals.

It would be an unpardonable mistake, were the veterinary corps not to profit by the experience gained in these schools. It is believed that the corps will be able to use to the utmost advantage the experience gained in conducting these schools in any system of instruction that may be established in the future.

Reorganization Plans

It may be of interest here to outline the plan for schools proposed in the reorganization of the Army Veterinary Service.

Candidates entering the army service hereafter will be given a year's training before being assigned to duty with troops. After passing the prescribed physical and professional examination, they will be commissioned as 1st lieutenants, Veterinary Reserve Corps. The training will be divided into a post-graduate theoretical course at the Veterinary Department, Army Medical School, Washington, D. C., followed by a practical course at a veterinary training center, yet to be decided

This photograph was taken at an abattoir in Antwerp, Belgium, where Lt. S. D. Wiles, V. C., U. S. A., delivered 365 head of U. S., I. C. army horses to be killed for meat. The people were very glad to see these coming in to their town for this purpose. Lieut. Wiles is standing to the left of the little Belgian boy in the center of the group and Lieut. Youngblood on the right. The colored soldiers are some of Lieut. Wiles' men from Veterinary Hospital No. 19, at Verdun.

upon. Each course will be from five to six months in length.

The theoretical course at the Army Medical School is planned to provide instruction in veterinary bacteriology and pathology; diagnostic and biologic laboratory methods; meat and milk hygiene; military veterinary medicine, with special attention to communicable and parasitic diseases; military veterinary hygiene, and regional surgery. Research work in animal diseases will also be undertaken here, where the opportunities for laboratory work will be unexcelled.

Officers who successfully complete the theoretical course at the Army Medical School will immediately be assigned to the practical veterinary training school to complete their training.

The practical veterinary training center will have to be conducted at a post or camp where a very large mounted command is located and a general veterinary hospital can be maintained to provide enough clinical material for teaching purposes. Here, it is also contemplated to teach enlisted men in the special branches needed for the veterinary service.

For officers, the practical training will consist of instruction in veterinary hospital administration, equipment and duties (include veterinary evacuation companies and veterinary evacuation hospital); surgical and medical clinics; communicable diseases—handling of, diagnosis of, etc.; horseshoeing instruction (practical and lectures); equitation; equipment of military animals (cavalry, field artillery, draft and pack animals, including instruction in packing); confirmation; examination for soundness and horse-judging; breeding; military animal management; manual of small arms (pistol); map-reading, and such military training as is necessary.

It must be understood that the courses of training proposed are contingent upon enactment of legislation and reorganization of the veterinary service by congress as a part of the Army reorganization contemplated. These plans are all in the hands of the General Staff.

The old veterinary corps, as it existed at the beginning of the war, consisted of 2 officers for each horsed regiment and 17 officers as inspectors of animals and meats. This limited and inflexible personnel is entirely inadequate. The corps is now greatly expanded and is functioning along broad general lines, similar to the other closely-related professional branches of the Medical Department and in general is organized similar to the veterinary services of foreign armies.

The main advantage of the veterinary corps of the army, as now organized, are: 1st, It provides the army for the first time in its history with a modern, scientific service. 2nd, By demanding the highest professional qualifications of the men entering it and offering adequate inducements in promotion, responsibility commensurate with grade, opportunity for research and original investigation, etc., it will quietly but persistently encourage a raising of the standard of the profession of the entire country. The second reason above stated is a paramount one why every member of the civilian profession, who has the real interests of his science and its advancement at heart, should be a staunch supporter of the army veterinary corps. The corps can only be as strong as the men who enter it from civil life can make it. There is no reason why it should not present an attractive career to the very best type of young professional man, but the desirable degree of excellence can be developed only by the personnel with the loyal assistance.

Once the veterinary corps is soundly established by legislative enactment—a result devoutly hoped for in the near future—the system of instruction as described above can go forward and develop along the general lines laid down for it.

Conditions Governing Promotions

The *Army and Navy Journal* of April 12, 1919, contained a column editorial on the subject of "Temporary Promotions in the United States Army." The subject of promotions is one that has caused more conjecture and worry than any other one thing connected with the organization of our large armies during this war.

Promotions for the regular army have always been and are now by seniority. However, with the passage of the Selective Service Act of May 18, 1917, promotions in the forces organized under that act were to be made by selection without regard to seniority. With the organization of the American Expeditionary Force, France, the situation was further complicated. The Commanding General, France, was given complete control over the promotions of all officers therein without regard to the

War Department, Washington. The promotions were made in France and then the War Department notified that such officers were promoted, the promotions confirmed in Washington and commissions issued accordingly. This condition precluded the possibility of officers who were in France being recommended for promotions by the heads of their respective service in this country. Such a condition brought about so far as promotions were concerned practically two separate armies; one consisting of the American Expeditionary Force and the other, the army in the United States.

It was not until October 4, 1917, that an order was issued by the War Department, organizing the veterinary corps for the existing emergency under the authority conferred by Section 2 of the Act approved May 18, 1917. This order stated the number of officers allowed for various grades and provided further that these numbers should not be exceeded except in the grade of 2d lieutenant.

During the first months of the war, and prior to the organization of the veterinary service, commissions were issued for this corps in the grade of 2d lieutenant only. A large number of these officers were sent to France prior to the organization of the veterinary corps above referred to and also before the organization could be put into effect in this country. The veterinary corps was no exception in this matter as the same condition prevailed in other branches of the service. The veterinary division, S. G. O., was soon confronted by the following situation. Veterinary officers in France could not be promoted except by approval of the Commanding General, A. E. F. Promotions could not be recommended by the director in Washington. The corps was enlarging rapidly in this country and promotions had to be made for officers to command units being organized. There was only one solution; to promote men in the United States to the grades authorized for the number of officers on duty; to keep count of the total number of officers in France and hold as vacancies, the grades that number would be entitled to have. This would allow the promotions of our officers in France to the grade permitted according to the strength of the corps on duty there. This was done.

The functioning of the veterinary corps in the A. E. F. in accordance with S. R. No. 70, War Department, December 15, 1917, was not accomplished until September, 1918, when Colonel White was made Chief Veterinarian, Office of the Chief Surgeon, A. E. F. Previous to this time, the corps was operating as a subsidiary organization of the remount service. Such were the prevailing conditions regarding promotions at the time the armistice was signed November 11, 1918. Immediately thereafter, an order was issued by the Secretary of War stopping all promotions from that date. This order in effect practically stopped all recommendations for promotion in the veterinary corps in this country that were made after November 1st. About 125 recommendations were returned from the Adjutant General's Office, disapproved because of the above order. It might be noted also that all original appointments were stopped at the same time and approximately 150 recommendations for commission failed to receive action. This order stopped the appointment of the enlisted 1918 graduate veterinarians who were at Camp Greenleaf and candidates for commissions.

Probably due to the entirely inadequate previous promotions of the veterinary officers in France, there have been a number of promotions to the grades of 1st Lieutenant, Captain and Major since the armistice was signed. In this country, however, the ruling of the Secretary of War has been strictly adhered to in so far as the veterinary corps is concerned.

On January 25, 1919, an announcement was made by Secretary Baker of the relaxation of the ruling previously made with reference to making no promotions. Such relaxation came as a result of widespread protest against the ban on army promotions announced immediately after the armistice. These promotions were to give rank appropriate to command in case of line officers and to actual employment in the case of staff officers, but promotions were not to be made for past services, however meritorious.

Par. 7, circular 79, reads: "No officer will be recommended for promotion unless the duty upon which he is engaged or to which he is to be assigned be commensurate with the advanced grade recommended and unless there is no officer of appropriate rank reasonably available for assignment to the duty in question, the officer making the recommendation will certify that these

conditions are fulfilled." Though recommendations may be submitted as contemplated in circular letter 79, no promotions will be made without the personal approval of the Secretary of War. The memorandum also directs that replies to the following questions in the case of each recommendation be submitted:

1. (a) Is the promotion to give rank to actual employment?

2. (b) Is the promotion a reward for past service?

3. (c) Does the work on which the officer recommended for promotion is to be assigned required in the best interest of the United States, the advanced grade recommended?

4. (d) Is there any officer of appropriate rank reasonably available for assignment to the duty to which it is proposed to assign the officer recommended for promotion?

In face of these precautionary warnings, in practically every instance the recommendation was disapproved.

On March 31, 1918, a letter from the Chief of Staff reviewed the situation of promotions and closed with this statement "that a Chief of Staff Corps or Department must include in his certificate of recommendation the further statement that the interest of the United States will positively suffer if the promotion is not made." To quote the *Army and Navy Journal* article of April 12, 1918, which clearly sums up the situation, "On its face, this has every appearance of a stop order on the recommendations invited by circular letter 79 and in the memorandum of March 3, 1919.

Veterinary Corps Commended by General Pershing

The Commander in Chief, American Expeditionary Forces, France, has recently commended the veterinary service through the Chief Veterinarian, Office of the Chief Surgeon, A. E. F., and expressed his appreciation as follows:

Now that active operations have ceased, it gives me a great deal of pleasure to express my thanks, in the name of the American Expeditionary Forces, to the officers and men of the veterinary corps, for their efforts and accomplishments during the war.

Starting as you did, with insufficient personnel, and laboring under severe handicaps, you nevertheless have overcome many obstacles and achieved results.

The care of our animals was one of the most important duties in the American Expeditionary Forces. It required skill, foresight, patience and perseverance. You and your predecessors had successfully created an organization for care and supply of animals that is a credit to our army.

It is indeed praiseworthy that the efforts of all did not cease at caring for and fulfilling demands for animals. Your zeal happily led you into research work and as a result, you have made many valuable discoveries concerning the nature of and cures for equine diseases. That by itself will be a lasting monument commemorating your unselfish and patriotic labor.

Walter Reed Hospital to be Made Training School for Medical Officers

The plans of the Surgeon General of the Army have already been announced for making the Walter Reed Hospital at Washington, D. C., a postgraduate training school for officers of the medical, dental and veterinary corps of the army and for army nurses.

This great army hospital was named in honor of the late Colonel Walter Reed, whose investigations at the risk of his life resulted in the discovery that yellow fever is transmitted from one person to another by means of the mosquito.

The project contemplates the expenditure of $10,000,000. The hospital already has the second largest medical library in the world and the leading medical museum in any country. There are 2,000 patients in it at the present time.

The Army, a magazine supplement to the weekly newspaper, *The Come Back*, published by the soldier patients of Walter Reed, says, with reference to the veterinary corps: "The Medical Department contemplates a very complete system of instruction for the veterinary corps officers, based upon the needs of the service developed during the war. The veterinary department of the Army Medical School will be developed as a purely scientific postgraduate school. All veterinary officers will be required to complete the course at this school before they are commissioned in the regular army. The course will extend over a period of six months. As their services can be spared, all veterinary officers now in the army will also be required to take this course. The veterinary corps will in this way be able to keep its officers instructed in the latest developments in veterinary science.

"The present plan will provide instruction in veterinary bacteriology and pathol-

ogy, diagnostic and biologic laboratory methods, milk and meat hygiene, veterinary medicine with special attention to communicable and parasitic diseases, veterinary hygiene and regional surgery."

The leading article in Volume 1, No. 1, of *The Army*, the magazine supplement to the newspaper published by the soldier-patients of Walter Reed Hospital, is by Lt. Col. Gerald E. Griffin of the veterinary corps. It is a most readable account of the broncho-busting contest between the veterinary training school at Camp Lee and the remount at the same place.

The article also contains an interesting and humorous account of the arrival at Camp Lee of various contingents of cowboys from the West for induction into the enlisted personnel of the veterinary corps. The article reflects credit upon the magazine, the author and the veterinary corps of the army.

The *5th Division Weekly Newspaper* published at Esch, Luxembourg, contains in a recent issue a pathetic account of the fate of wornout horses of the army of occupation that are being condemned and sold by the hundreds for a few francs each to spend the remainder of their lives between the shafts of cumbersome native carts. The account ends with the following tribute to the courage, fidelity, usefulness and suffering of the horses in this war.

He went without His chow the same as we
And struggled in the mud and freezing rain,
And brought us the things that brought us victory,
And endured all the misery of the dirty rotten game.

When we rested in the holes at Montfaucin,
From the hell of Fritz's fury up ahead in Bois De Rappe,
He hauled and heaved the chow carts right along—
The Steward of the Dough Boy, He was that.

When we took the shattered Village of Cunel,
And chased the stubborn Germans to the hills,
He stuck there in those hours of molten hell,
Brought Chow and ammunition with a will.

The night crept across the Meuse at battered Dun
He brought the bridge that spanned the bloody way,
And hurried cross with rifle, raff and gun,
When the Dough Boys stormed the heights at break of day.

He toiled and struggled onward in the hell of inky night,
And floundered on to serve us on those wretched haunting trails,
He went a fearless warrior in the thick of every fight,
To death without a falter when others shook and paled.

He breached the bloody gaps of bomb and shell torn roads,
Not an instant did He falter when His comrades fell about,
But came on and on a savior with his precious loads
That helped us put the dirty Hun to route.

Now if you pass one while you're strolling
Up and down the quaint old streets,
Look for "U S" on his shoulder,
He may be an old time Buddie, a Tom or Bill or Pete.

Stop a moment while you're passing,
Pat the boy on the nose,
For we might still be in the mud upon our belly,
But for old comrades such as those.

H. A. D.

Major General Joseph E. Kuhn, commander of the 79th Division of the A. E. F., has commended the veterinary service of the Division in the following official communication to Major Ernest W. Hogg, Division Veterinarian:

1. The fact that the 79th Division won the IX Corps Horse Show and that the Commander-in-

Captain Colenzo H. Hoffmire, of Archbold, O., on the left, and Lieut. Adolphus Moore, of Marion, Ala., on the right, at Neufchateau (Dept. Vosages), France, last summer.

Captain Hoffmire has recently returned to the United States, after a year's service with the A. E. F. He went to France in March, 1918, with Veterinary Hospital No. 6, commanded by Major Geo. B. McKillip, of Chicago, and the last six months of his stay overseas were spent with Major McKillip in the Base Section. Following his return, Captain Hoffmire purchased the property and practice formerly owned by his father at Archbold, O., where he is now engaged in practice.

Chief complimented the appearance of its field transportation on the occasion of his inspection and review on April 12th, prove conclusively that the animals of this division are in excellent condition. The division Commander has himself noted with satisfaction that the condition and appearance of all animals have been steadily improving during the past three months.

2. At this time, when the division transportation is being turned in preparatory to the division's movement to the embarkation center, it seems a fitting occasion for the division Commander to record officially his appreciation of the veterinary service of which you are the head. Although issued poor and mangy stock, the same has been brought to such a condition as to win commendation from high authority. This is a record of which we may all feel proud, especially the veterinary service, which contributed so effectively to this result.

3. The division Commander wishes to convey to you and through you to all members of the veterinary service his appreciation of the veterinary service and to thank the members thereof for their loyal and willing effort to bring and maintain the division animals to a high standard.

Major George A. Hanvey, Division Veterinarian of the 88th Division, A. E. F., in a letter recently received in Chicago, says:

I have had a very nice and interesting vacation down at Nice for a couple of weeks, which was a very much needed rest, the first I have had in over four years. It was indeed a very pleasant change from most of the stations in France where the weather is rather disagreeable and it is raining or snowing most of the time, to get down there where the bright sunshine put new life into a fellow.

I have just returned from a very interesting trip to the shell-torn country around Verdun. It was a long hard trip but well worth while. I thought that I had seen before something of the ravages of war, but until I saw the battlefield around Verdun didn't realize how utterly desolate and torn the country could be, there is not an inch of soil in some sections where there has not been shell holes; where once were great forests there is absolutely nothing left but shell holes, and debris of war; where once were prosperous little villages nothing is left but a pile of mud or stones; occasional bones and parts of bodies are still found in places in spite of the continuous hard work to clean up since the armistice nearly five months ago.

Things are moving along fairly well with us over here; still plenty of work for the veterinarians to do, and very few of them have been relieved and sent back to the States up to the present time, the process of selling or turning over the animals to the French seems to be moving along very slowly, and the hospitals and remounts are still pretty well filled up. The divisions that are still on duty have fairly good mounts, but it is a hard proposition to take care of them when they are scattered around so much. Mange is pretty well under control but requires constant work and attention, and lice, ulcerative lymphangitis, and glanders, are a few of the other things that have to be constantly looked out for and kept under control

Captain Black Comments on Camp Conditions.

Dr. W. G. Black, formerly of Norfolk, Va., has been discharged from the veterinary corps and has located in Alberta, where he will engage in raising cattle and hogs.

Dr. Black entered the service of the Canadian army in June, 1915, and served as conducting officer. On his first trip he took 1,317 animals from Newport News to Avenmouth, England, leaving June 8th and landing June 22nd, losing only four animals on the trip and delivering 1,313 in good order, a remarkable record. Dr. Black's most exciting experience in the army was on a trip from Newport News to Alexandria, Egypt, when a submarine was encountered in the Mediterranean Sea. The torpedo missed the boat by about twelve feet, however, and no damage was done.

When the veterinary corps of the American army was organized, Dr. Black was commissioned and assigned to Camp Jackson, as senior veterinarian at the remount. Later he spent three months at the training school at Camp Greenleaf, thirty days in training and two months as instructor in equitation; later going to Camp Johnson as camp veterinarian and senior veterinarian at the remount. Later. he was assigned to Camp Lee, where he received orders to proceed overseas with base hospital No. 25. The hospital unit got over, but owing to the signing of the armistice, none of the officers went with it. They returned to Camp Lee and demobilized.

In Capt. Black's opinion the British and Canadian veterinary corps are much better organized than the American corps, and a veterinarian in the British army has a far better opportunity to render good service than in ours. He believes that the American veterinary service should be reorganized and that the remount work should be placed in the veterinary corps,

and the latter entirely separated from the medical corps.

He regards the discipline of the veterinary corps at Camp Lee as having been unnecessarily severe and not conducive to getting out of the veterinarians the best that was in them. The training school at Camp Greenleaf he regarded as much superior to the one at Camp Lee. At Camp Greenleaf the veterinarians were given sanitary drill, at Camp Lee infantry drill, at Camp Johnson, cavalry drill, at Camp Jackson infantry drill. As many veterinarians spent only a short time at each place, the result was very confusing to them.

In all his experience in the British and American armies and in civil life, he stated that he had never seen men so insolent and insulting as the infantry officers at Camp Lee. He believes that Camp Lee excelled any other place in the British or American armies for downright disagreeableness, not to say "cussedness."

After being nearly two years in the army, he was assigned to Camp Lee and required to stand at reveille at 5:45 in the morning, behind a lot of raw recruits who had never had any drill. Men with experience were given no chance to drill the men, but young veterinary officers, without experience, were selected to drill the men apparently for the sole purpose of embarrassing them.

To quote Capt. Black: "Of course, military training is all right, and necessary, but there is such a thing as overdoing it and this is what they did at Camp Lee.

"When I was at Camp Johnson it was very hot. So hot, in fact, that if one laid a clinical thermometer on the sand it would burst immediately. On account of the heat, we worked in our shirt sleeves. A French officer visited the camp one day and said it was very undignified for officers to work that way. The colonel looked us over and issued an order that officers wear their blouses at all times while on duty. After that it seemed hotter."

Dr. Black believes that these conditions cannot be wholly remedied until the veterinary corps is made independent of other organizations.

Concerning the need for new legislation affecting the veterinary corps one of the veterinary officers with many years' experience, writing from France, says:

"I read with great interest the article you published in the April Journal entitled "A Critical Consideration of the Veterinary Training Schools at Camp Greenleaf and Camp Lee During the War." I feel grieved that our confreres who came into the army to help us during the present world crisis are going back to civil life with such feelings of dissatisfaction. I feel that most of those who served overseas will go back harboring similar sentiments. I, for one, do not blame them in the least, but I do not feel that the older men of the corps are the ones to blame, since throughout the whole war we were always held subservient to some one belonging to some other departmental head and we were never allowed to execute matters according to our own ideas. From what I can learn relative to the school at Camp Lee this sort of administration was very much in evidence.

"This method was well illustrated in the A. E. F. when our chief veterinarian was deposed and a cavalry officer from the remount service of the quartermaster department placed at the head of the veterinary service as chief veterinarian. For some reason our corps was never given sufficient rank in the higher administrative positions, for our officers to command the respect of commanding generals to properly and efficiently accomplish those things which very often seemed best for the veterinary service. The reason for this has never been made clear to me, unless the medical department, of which we are a part, felt that we were not deserving. A decision was made and published a year ago that veterinarians could be promoted to the grade of colonels in the veterinary corps for administrative positions. The result was one officer promoted to a colonel, four lieutenant colonels, and these were all given to the stay at home with one exception: the case of Colonel White, who came to France and was demoted after the short service of two months.

"I have at all times admired the way you have, through the Journal, championed the cause of the army veterinarians who came into the service out of purely patriotic sentiments. I hope you will promote a better understanding of the true causes for the failure of the veterinary corps to receive the consideration that was and is its due."

Grade of Major Restored

The following veterinarians, with the rank of Captain in the Veterinary Corps, Regular Army, have been restored to the rank of Major in the Veterinary Corps, Regular Army, as a result of the decision of the Comptroller of April 9, 1919: Frederick Foster, Gerald E. Griffin, Charles D. McMurdo, William G. Turner, William V. Lusk, Olof Schwarzkopf, Joseph R. Jefferis, Harry F. Steele.

Officers, Veterinary Corps, U. S. A.

	On duty April 11, 1919	On duty May 11, 1919
Colonel	0	0
Lieutenant Colonels	2	2
Majors	78	75
Captains	182	173
First Lieutenants	487	462
Second Lieutenants	555	503
	1304	1215

Major John H. Gould, V. C., who was Chief Veterinarian, second army, from December 1st, 1918 to April 15th, 1919, when this army was officially disbanded, has been transferred as Chief Veterinarian to the third army with station at Army Headquarters Coblenz, Germany.

Major Harold E. Bemis, V. C., who has been Chief Veterinarian, third army, is to be ordered to the United States for discharge.

Major Walter Fraser, V. C., who has been on duty with General Headquarters, Chaumont, France, has been relieved and made Assistant Chief Veterinarian, Advance Zone, relieving Major Reuben Hilty who has been ordered to the United States.

Promotions and Transfers

The following officers, now serving with the veterinary corps, A. E. F., have been promoted to the grades noted:

1st Lieut. to Captain: Raymond Randall, Michael Donahoe, Charles P. Bishop, George E. Butin.

2nd Lieut. to 1st Lieut.: Emory W. Tolley.

The following orders of transfer and reassignment of veterinary officers have been issued during the past month:

Major D. J. Lynch, V. C., from A. R. D., Camp McClellan, Ala., to A. R. D., Fort Bliss, Texas, for duty as the veterinary.

Major Joseph W. Burby, V. C., from Camp Jackson, S. C., to Camp Gordon, Ga., for duty as Camp Veterinarian.

Major Wm. P. Hill, V. C., from A. R. D., Camp Meade, Md., to A. R. D., Camp Travis, Texas, for duty as the veterinarian.

Major Harry F. Steele, V. C., R. A., from U. S. Army General Hospital, East View, N. Y., to Fort Sam Houston, Texas, for duty as Assistant to the Department Surgeon, Southern Dept.

Captain Gordon B. Huse, V. C. from A. R. D. No. 320, Camp Custer, Mich. to Camp Lee, Va. for duty at the Camp Veterinary Hospital.

Captain Will C. Griffin, V. C. will report for duty as the Camp Veterinarian, Camp Harry J. Jones, Ariz.

Captain Ivan L. Barstow, V. C., from Camp Dix, N. J., to Aberdeen, Md., for duty as the veterinarian.

1st Lieut. Ion W. Parks, V. C. from Camp MacArthur, Tex. to Ft. Sam Houston, Tex. for duty as assistant to the Post Vet'n.

1st Lieut. Fred L. Seevers, V. C. from A. R. D. No. 313, Camp Shelby, Miss. to A. R. D. No. 315, Camp Jackson, S. C. for duty.

1st Lieut. John A. Phillips, V. C. from Camp Dix, N. J. to Ft. McIntosh, Tex. for duty as the Veterinarian, Laredo District.

1st Lieut. Howard W. Wilson, V. C. from A. R. D. No. 317, Camp Pike, Ark. to A. R. D. No. 327, Ft. Sill, Okla. for duty.

1st Lieut. Oscar E. Glandelter, V. C. from A. R. D. Ft. Bliss, Tex. to Chicago, Ill. for instruction in meat inspection.

1st Lieut. Wm. E. Spierling, V. C. from A. R. D. No. 307, Camp Wadsworth, S. C. to Field Remount Squadron No. 353, Camp Wadsworth, S. C. for duty as the Veterinarian.

1st Lieut. Dennis S. Shannon, V. C. from Camp McClellan, Ala. to Port of Embarkation, Newport News, Va. for duty.

1st Lieut. Clifton G. Crumpacker, V. C. from A. R. D. No. 309, Camp McClellan, Ala. to Ft. Reno, Okla. for duty as Ass't Vet'n.

1st Lieut. Chester L. Nelson, V. C., from A. R. D. No. 309, Camp McClellan, Ala., to A. R. D. No. 329, Camp Travis, Tex., for duty.

1st Lieut. Charles E. Richardson, V. C., from A. R. D. No. 309, Camp McClellan, Ala. to A. R. D. No. 329, Camp Travis, Tex., for duty.

1st Lieut. William S. Ford, V. C., from Camp Dix, N. J., to Garden City, L. I., N. Y., for duty as C. V., Air Service Depot, that place.

1st Lieut. Samuel H. Saul, V. C., has been relieved from duty as Asst. to Dept. Surgeon, Panama Canal Zone, and directed to proceed to his home and return to the retired list.

1st Lieut. Earl P. Gordon, V. C., from Camp Dix, N. J., to Fort Riley, Kan., for duty at the Mounted Service School.

1st. Lieut. John K. McConeghy, V. C., from Aberdeen, Md., to San Francisco, Cal., thence to Vladivostok for duty with the American Expeditionary Forces, Siberia.

1st Lieut. Harry Dixon, Jr., from A. R. D., Camp McArthur, Tex., to San Francisco, Cal., thence to Vladivostok for duty with the American Expeditionary Forces, Siberia.

1st Lieut. George H. Seaver, V. C., from Camp Lewis, Wash., to A. R. D., Camp Kearny, Cal., for duty.

1st Lieut. F. B. Croll, V. C., from A. R. D., Camp Dodge, Iowa, to A. R. D., Camp Funston, Kan., for duty.

1st Lieut. Fred L. Bear, V. C., from A. R. D., Camp Sheridan, Ala., to A. R. D. Camp Travis, Texas, for duty.

1st Lieut. S. W. Stokes, V. C., from Camp Grant, Ill., to A. R. D., Camp Grant, Ill., for duty.

1st Lieut. George S. Place, V. C., from duty at Port of Embarkation, Newport News, Va., to A. R. D., Fort Sill, Okla., for duty.

2nd Lieut. Emil E. Weller, V. C., from A. R. D. No. 329, Camp Travis, Tex., to Camp Travis, Tex., as Asst. to the C. V.

2nd Lieut. Robert H. Campbell, V. C., from Camp Dix, N. J., to A. R. D. No. 329, Camp Travis, Tex., for duty.

2nd Lieut. Harry L. Watson, V. C., from A. R. D. No. 313, Camp Shelby, Miss., to A. R. D. No. 315, Camp Jackson, S. C., for duty.

2nd Lieut. Harry I. Stanton, V. C., from A. R. D. No. 309, Camp McClellan, Ala., to Douglas, Ariz., for duty with the 1st Cavalry.

2nd Lieut. Harry C. Fullington, V. C., from

A. R. D. No. 316, Camp Gordon, Ga., to Camp Bowie for duty as Asst. to the C. V.

2nd Lieut. Warren R. Sheff, V. C., from Camp Dix, N. J., to the Canal Zone, Panama Canal Department for duty.

2nd Lieut. Noah J. Elder, V. C., from A. R. D. No. 305, Camp Lee, Va., to Camp Bragg, Fay- [illegible] C., for duty as Asst. to the C. V.

2nd Lieut. A. E. Joseph, V. C., from Camp Dix, N. J., to Fort Warren, Mass., for [illegible] the veterinarian in the Coast Defenses of Boston.

2nd Lieut. L. T. Nagel, V. C., from Port of Embarkation, Newport News, Va., to North Charleston, S. C., for duty.

2nd Lieut. Wm. A. Martin, V. C., from A. R. D., Camp Sheridan, Ala., to Fort Bliss, Tex., for duty with the 82nd F. A.

2nd Lieut. W. F. Ridley, V. C., from Camp Dix, N. J., to A. R. D., Camp Devons, Mass., for duty.

Honorable Discharges

The following officers have been honorably discharged from the Veterinary Corps, United States Army:

Major E. B. Ackerman, U. S. A., who was on duty as the veterinarian, Camp McClellan, Ala.

Major John H. Blattenberg, U. S. A., who recently returned from duty with the American Expeditionary Forces, France.

Major Harry W. Brown, who has just returned from service overseas.

Major R. M. Staley, who has been acting as General Veterinary Inspector for the Southern Department.

Captain V. F. Pruden, who was on duty as Camp. Vet., Camp Hancock, Ga.

Captain R. H. Sewell, who was on duty as Camp Vet., Camp Travis, Tex.

Captain C H. Hoffmire, who recently returned from the American Expeditionary Forces, France, where he was on duty with Veterinary Hospital No. 6.

Captain N. B. Giles, who was on duty at the A. R. D., Camp Beauregard, La.

Captain Wm. A. Bright, who was on duty as Camp Vet., Camp Sheridan, Ala.

Captain R. E. Kyner, who recently returned from duty with the American Expeditionary Forces, France.

Captain G. E. Bartholomees, who was on duty as Camp Vet., Camp Beauregard, La.

Captain T. B. Hinkle, who was on duty at A. R. D. No. 329, Camp Travis, Tex.

Captain C. F. Henry, who was on duty at Zone Vet., Kansas City, Mo.

Captain Ralph M. Bell, who was on duty as the Vet., A. R. D. No. 304, Camp Meade, Md.

Captain William E. Muldoon, who was on duty at the Camp Veterinary Hospital, Camp Lee, Va.

Captain Omar T. Atwood, who has recently returned from the American Expeditionary Forces.

Captain Thomas J. Quinn, who has recently been on duty with the American Expeditionary Forces.

The following 1st Lieutenants, V. C., U. S. A., have been honorably discharged during the past month:

N. A. Roettiger, P. J. Creedon, C. H. Wight, L. C. Martin, R. W. McKibin, E. D. King, Jr., J. B. McClellan, O. M. Webb, R. L. South, L. W. McBlyea, J. F. Jansen, Jay E. Nixon, C. T. Chamberlain, C. B. Lenker, W. J. Schimmel, A. T. Cornell, V. C. Bartlett, Will W. Korb, F. W. Graves, A. C. Morrow, L. W. Rowles, J. C. Hoover, E. M. Hough, E. J. Watters, Edward M. Lynn, Derrell E. Trump, Howard W. Naylor, F. J. Scheloski, F. E. Kunze, J. A. Tognotti, E. S. Carter, John N. Egan, Emory E. Hobson, Geo. J. Goubeaud, Oliver A. Taylor, E. H. Lenheim and R. B. Jones.

The death of 1st Lieut. J. D. Lee, V. C., N. A., who was on duty with the American Expeditionary Forces in France, has been reported. He died from bronchopneumonia.

The following 2nd Lieutenants, V. C., U. S. A., have been honorably discharged during the past month:

S. Yetter, J. S. Dick, E. D. Harris, R. E. Libby, H. B. Weeden, A. H. Kerr, George D. Anderson, E. W. Pierce, E. Bruce, L. A. Huseby, E. E. Watson, H. F. Walker, W. H. McKahan, C. E. Wood, J. C. Mitchell, L. V. Walker, Clarence L. Young, F. M. Nelson, E. C. Reither, G. J. Lengerich, J. E. Randall, W. J. Kiff, Wm. H. Shannon, G. H. Starr, W. N. Timblin, E. A. McCain, F. F. Rosenthal, H. W. Schirmer, Richard I. Kerley, E. C. Baker, J. R. Barnes, J. H. Kitzhofer, C. E. Freeman, R. B. Whitsell, Karl A. Trish, A. G. Frees, H. V. Cardona, F. Edwards, G. C. Greene, J. A. Flinn, J. M. Herron, E. Kernohan, D. W. Wright, P. E. Phillips, A. M. Stark, E. M. Ogram, R. H. Gittins, Joseph H. Stephens, John F. Rock, S. P. Ragan, Wm. J. Cozad, James L. Sanders, Edward A. Cholvin, Herbert T. Cook, Charles S. Babcock, E. W. Kern, E. B. Jordan, J. E. Reedy, T. L. Knapstein, W. A. Hahn, T. V. Ward, Howard F. Roberts, J. W. Boylston, W. E. Fritz, G. Smith, Jr., John S. Nicholas, Leland G. Dassance and Harry H. Owen.

MOVEMENTS OF RETURNING MEN

Dr. R. Lane, who received his discharge from the service in February, has established himself in practice at Smithfield, N. C.

Dr. O. L. Campbell, who has been in the service for the two years, and who recently returned from overseas, has resumed practice at Astoria, Ill.

Dr. W. H. Fitch, of Masquoketa, Ia., following release from military service, has located at Bennett, Ia.

Dr. N. A. Roettiger, after two years in military service, most of which was spent at Camp Lewis, has resumed practice at Winona, Minn.

Having served in the army since early in the war, Dr. Paul Johnson has accepted the position of assistant state veterinarian of Arkansas, with headquarters at Little Rock.

Dr. B. Bennett, late of the Remount Depot 325, Camp Logan, Tex., has resumed practice at Shawnetown, Ill.

Following discharge from the army, Dr. J. D. Corson, has returned to his practice at Leaf River, Ill.

Dr. O. Q. Mosey, late of the service and formerly with the B. A. I., has entered into partnership with Dr. R. Mollance at Reinbeck, Ia.

Considerable newspaper comment has been given to the fact that Lieut. Geo. E. McEvers, 65 years old, who went overseas with the 122d Field Artillery, and who states that he served every day and was never sick and never missed a meal, had a son in the medical corps who gained the rank of a major. Just what sort of a story Lieut. McEvers put over to get into the service at his age is not given out, but whatever it was he seems to have "made good on the job," according to all reports.

New York V. M. A. Meeting

OF NEW YORK CITY

The regular monthly meeting of the Association was held in the lecture room of Carnegie Laboratory, Wednesday evening, April 2nd, President David W. Cochran presiding.

The speakers of the evening were Dr. Adolph Eichhorn, of Pearl River, N. Y., and Captain Harry Ticehurst of Morsemere, N. J.

Dr. Eichhorn's topic was "Pre-War Meat Inspection and Sanitary Conditions of Public Abattoirs in Various Countries in Europe." He described the construction of the abattoirs and told of the rules and customs governing them, most of the buildings being of the most modern sanitary type and construction, surrounded by pleasant attractive and well kept grounds. There is usually a gate-keeper or chief porter who makes inquiry of all those seeking admission and for those not calling on business, a fee is charged for admission and guide service.

The abattoirs at Breslau are the finest and largest in Europe. He described the method of killing beeves and hogs, and stated that there is a growing tendency in Europe to handle stock very much as it is handled in this country, that is, bought and slaughtered by large wholesalers who in turn supply the retail butcher. The custom for years past has been for the retail men to take their animals to the municipal abattoirs where they were slaughtered for a certain fee and then taken away. The abattoirs are municipally owned and under strict municipal regulations. The offal is dumped in cars directly from the killing floor and moved away.

There are large sterilizing tanks for heating conditionally passed meat, that is, meat not considered fit to be marked "passed" as sound meat and still not sufficiently diseased to be condemned entirely. These portions are first sterilized and then sold for about 50 per cent of the price of sound meat. The supply of this kind of meat is never sufficient to meet the demand. All animals that are being detained awaiting slaughter, or for any other reason, are fed and cared for under municipal direction so that they will in no way suffer while being detained. All inspections are conducted by veterinarians.

In the inspection of horse carcasses, in addition to the routine inspection, the head is sawed in two longitudinally so as to expose the nasal septum. In hogs, four samples of tissue are taken and six examinations made of each sample. Trichinosis is gradually being reduced, only one case occurring in thousands of carcasses examined. In one abattoir only two cases were found in over a quarter of a million animals examined.

The condemnation of meat in general and particularly as regards tuberculosis, is not as rigid as in the United States.

All cars that carry stock must be thoroughly cleaned and disinfected before being used for stock again. They are first cleaned roughly and then with a steam-heated soda solution, with additional disinfection if the cars have been knowingly contaminated by infected animals.

Some of the abattoirs, particularly those in Germany, maintain inspection for dog carcasses to be used for food. Some of the abattoirs and stockyards are large and extensive, costing as much as six million dollars. All animals handled and inspected at these abattoirs are insured and all carcasses or parts of carcasses that are condemned are paid for in full by the insurance companies.

Dr. Ticehurst discussed "Necrobacillosis." This was one of the most serious troubles at the remount depots, due largely to the condition in which the paddocks get in low land. In one remount depot with a capacity of 10,000 horses thousands of cases of necrobacillosis were treated.

Some authorities believe that gangrenous dermatitis and necrobacillosis are identical. Some cases seen by Captain Ticehurst seem to contradict this, the seat of the infection being so often located in the frog. As regards treatment the removal of the frog and the application of a paste of lead and zinc seem to give best results. No practical method of immunization has been worked out. Paralysis of the lower lip was a frequent sequela.

In discussing Captain Ticehurst's paper, Dr. Geo. Berns, of Brooklyn, recalled a large num- of similar cases in New York City in the early '80's. It was then thought to be due to frost bites and frozen heels, caused by ice and slush to which salt had been added by street railway companies. However, some of the cases occurred when snow and ice had disappeared.

Dr. Berns read a paper on this subject during that period and styled it "Suppurative Cellulitis," but he now believes these were cases of necrobacillosis.

Major Ackerman recalls seeing cases similar to those spoken of by Dr. Berns, but believes the cases at the remount depots much severer and not the same ailment. Major Ackerman stated that frequent thorough cleansing of the paddocks reduced the number of cases promptly. In his experience frequently changed antiseptic packs and dry covering proved the best treatment.

Major Ackerman also gave a very interesting talk on camp life, explaining the duties, drills, rules, etc.

Goshen, N. Y. J. F. De Vine.

DEPARTMENT OF

BOVINE PRACTICE

Edited by JOHN FRANCIS DE VINE, D. V. S.

Pathology and Treatment

WHILE some authors discuss at considerable length the pathology of this ailment, when all is summed up it is about equivalent in actual knowledge to what is known as to its etiology. Some claim to have found postmortem changes which others fail to note entirely; some point out certain changes in the pia mater; some have found the brain substance anemic, while others have considered it congested, and still others say the central nervous system shows no change, with the possible exception of anemia.

The secondary changes which occur due to complications such as injuries from flouncing about or mechanical pneumonia, surely cannot be considered as belonging to its pathology.

Williams[6] sums up the theory regarding the nature of parturient paralysis by stating that they are innumerable and difficult of classification and that they may be divided into four great classes according to the beliefs which veterinarians hold as to the organ or system in which the disease takes its origin.

"1. Many hold that the disease has its origin in some essential change in the brain or spinal cord. They believe the disease to consist of a congestion of the entire central nervous system, with overfilling of the veins of the brain and spinal cord. Other veterinarians hold that the disease consists of anemia and paralysis of the central nervous system.

"2. Another group of veterinarians believe that the disease has its essential origin in the uterus. In this group each individual has an opinion of his own which differs somewhat from that of each of his colleagues. Some of them believe that from the uterine mucosa there is absorbed into the system a certain amount of infectious material, or the products of bacterial activity within the uterine cavity, acting upon the central nervous system, produce the disease. The character of this toxic substance has not been revealed nor has any clear evidence been adduced to show that such exists.

"It has not been shown why if the disease consists of absorption of toxic substances from the uterus, cows which are thin in flesh, are poor milkers, or why those that have suffered from dystocia, should not just as readily suffer from milk fever as deep milkers, which are in high condition and calve easily. Others, like Stockfleth, hold that milk fever is the result of embolism of the veins of the uterus, the emboli escaping to other parts of the body.

"3. A third group of veterinarians, including Schmidt of Kolding, holds that the disease arises from the mammary gland and consists of a toxemia due to asborption of colostrum, perhaps incompletely formed, or other secretions of a highly deleterious character.

"4. Harms holds that the disease is a form of aeremia or air in the blood. In his postmortem examinations he found air in the veins of the brain, spinal cord, lungs and other organs. This view has not been generally accepted."

In the face of the lack of any positive information on the pathology of this disease, after citing the opinions of these eminent authors, it would seem little short of ludicrous for one like myself, who has not had the advantage of scientific coworkers or extensive laboratory equipment, to even venture an opinion as to its pathology, basing as I must my opinion purely on deductions from clinical experience, were it not self-evident from the opinions just cited that those who have made extensive study of the pathology hold such widely different views.

To me the ailment presents constantly evidence of a disturbed circulation with a resultant anemia of the brain, creating as it progresses either a reflex toxic or a direct influence on the center of the circulation. This is readily believable in the case of the plethoric cow that is either carrying, or gives easy birth to a large well developed fetus, indicating that the uterus has received a generous blood supply.

[6]Williams Obstetrics. Page 619.

We know that physiologically when such a fetus is born there is a reversion of the blood supply from the uterus to the udder; the greater the development of the udder and its vascular structure the more pronounced must be this change of circulation, probably approaching shock in a plethoric animal, that has been nourishing a fetus by a generous uterine circulation.

This would seem quite plausible in the average animal that suffers from parturient paralysis, since all authorities seem agreed that this type of animal is the most susceptible to this ailment. This theory is apparently further strengthened when we consider how these cases respond to air-pressure in the udder, when the udder is promptly and tensely inflated, applying pressure as it must to the vascular system of the udder.

We notice in pronounced cases of parturient paralysis, a relief of the brain symptoms beginning in from fifteen minutes to one hour after the udder has been inflated. With the improvement of the brain symptoms we also notice what appears to be a steady improvement in the general circulation of the afflicted animal; the skin and extremities take on warmth, the pulse becomes more regular, the temperature approaches normal and such organs as the bladder and intestinal tract give evidence of returning function. If the udder be improperly inflated, this general improvement is slower in its onset and recovery delayed or aborted.

It is common knowledge where a calf is not carried to full term or where there is an obstructed or prolonged act of parturition, the occurrence of parturient paralysis is proportionately lessened. These two conditions produce a lesser or slower disturbance in circulation.

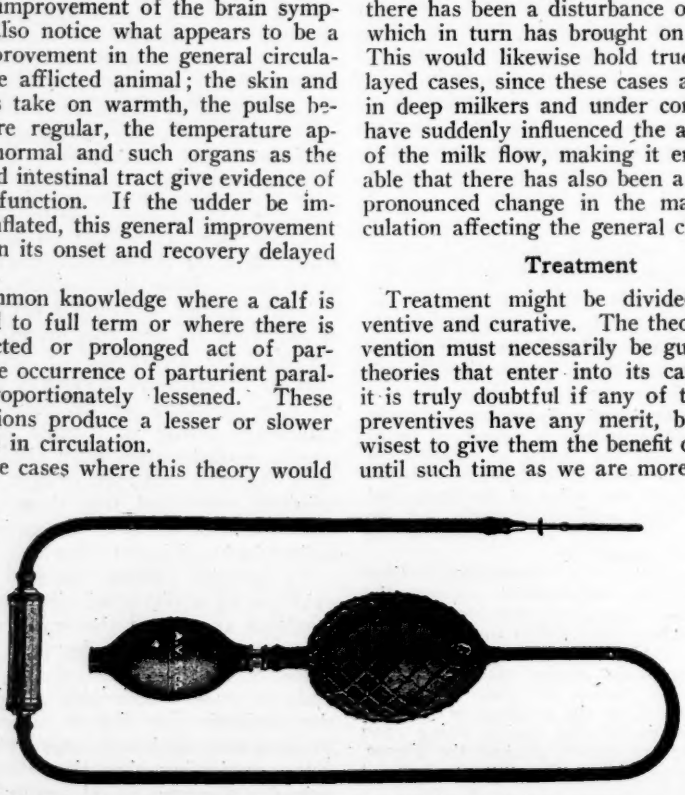
There are cases where this theory would not seem entirely tenable, for instance, when the onset of the disease is manifest more by an apparent hyperemia of the brain than an anemia, that is where the symptoms are more excitable than paralytic; however, this would seem explainable by the fact that there may be in these cases a transient hyperemia (as these symptoms are always brief in duration) during the early period of the sudden change in circulation from the uterus to the udder.

Other cases in which it might appear that this theory is not applicable are such cases as occur just prior to parturition or a considerable period after parturition. However, is this change of circulation not just as explainable in these cases as are the cases themselves, deviating from the usual?

In the case where parturient paralysis is manifest prior to calving it does not occur at any great interval prior to the act of parturition, therefore it cannot be regarded as an impossible phenomenon, that there has been a disturbance of circulation which in turn has brought on the disease. This would likewise hold true in the delayed cases, since these cases always occur in deep milkers and under conditions that have suddenly influenced the augmentation of the milk flow, making it entirely probable that there has also been a sudden and pronounced change in the mammary circulation affecting the general circulation.

Treatment

Treatment might be divided into preventive and curative. The theories of prevention must necessarily be guided by the theories that enter into its causation and it is truly doubtful if any of the so-called preventives have any merit, but it seems wisest to give them the benefit of the doubt until such time as we are more positive as



Apparatus for udder inflation with bulb attachment

to the whole phase of this ailment. Some believe that the disease is more prevalent in the animal that is kept closely confined and fed on concentrates; this would suggest more freedom and careful feeding of balanced concentrates, particularly during advanced pregnancy.

Others are of the opinon that it occurs more frequently in the animal that has access to a plentiful pasture. Still others, that a poorly nourished and neglected animal has less natural resistance and consequently is made more susceptible. The latter theory is unquestionably wrong since animals in such physical condition are not the ones that we frequently are called to treat for this ailment.

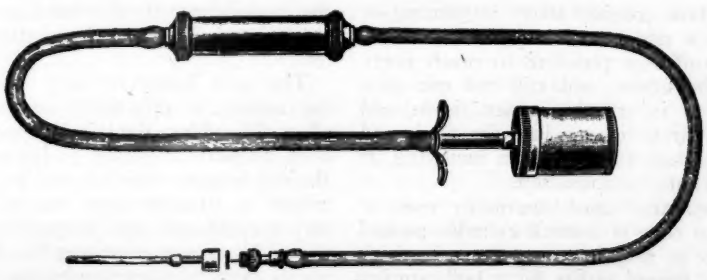
My experience leads me to believe that when an animal has received what we style good dairy care, that is, kept under good comfortable, hygienic conditions, fed sparingly of a light proper ration, and special attention paid to the eliminatory organs during the last ten days or two weeks of pregnancy, seeing that the kidneys are active, the bowels loose, the animal free to exercise daily and has access to plenty of salt and water, we have reached the limit of our present knowledge in preventing milk fever.

It is well to bear in mind that succulent and laxative foods are far better than medication of salines and the like that some resort to.

After the cow has calved, there are two theories today that simple logic would influence us in believing may have some merit in guarding off attacks. One is the inadvisability of completely emptying the udder for the first few days after calving, but rather leave it largely to the newborn calf to take care of, as would be the case in Nature; and the other is the advantage of leaving the newborn calf with the dam for the first few days for the benefit of the udder and the psychic influence it would have upon the dam at that critical period. All men of experience know how much more acute is the concern of the animal mother about her offspring the first few days and that when the offspring is taken away immediately there is the possibility, that worry may have some influence as an exciting cause of parturient paralysis. However, it would be difficult to determine with any accuracy how many cases of parturient paralysis have ever been avoided by this reasoning and these methods. On the other hand, we know positively that it does not prevent all, since in our own experience we have repeatedly had cases in herds where these ideas have long been in practice and in contradiction it is interesting enough to warrant relating here that in a herd of some 60 pure-bred Holsteins over which I had veterinary supervision, we decided some ten years ago to raise the calves from this herd on what might be termed a modified Bang system.

The original herd had not been tuberculin tested but all calves when dropped were allowed to stay with the dam until they were dry and had nursed once; they were then taken to a separate part of the farm where they were fed milk that had been heated to the boiling point; notwithstanding that almost every animal in this herd was a deep milker (some of them were World-Record cows), milk fever has been less prevalent in this herd than in any herd of its size and character that has come under my observation.

This experience consequently shatters my faith in the theory of the psychic effects produced by removing the young as a causative factor in milk fever. When the animal is attacked with the disease certain factors that might be styled intelligent



Apparatus for udder inflation through which the air is forced by means of the small metal pump.

nursing must always be considered in addition to the inflation of the udder, if the highest percentage of successful terminations are to be expected.

The attendant in charge of a case should be informed at the earliest possible moment of the danger and uselessness of drenching an animal. Likewise, too much stress cannot be laid upon the necessity of propping an animal up on her sternum and padding with bags of hay, straw or chaff to hold her in that position and thus guard against early digestive complications, either suffocating or choking the animal before proper sistance can be given or the regurgitated food being inhaled into the lungs with resultant gangrene and death.

Where animals are very restless and violent they can often be restrained from doing violence to themselves and at the same time held in a satisfactory position, by guy lines either from their horns, or by a halter.

The treatment proper consists in the inflation of the udder with either oxygen or filtered air. This when accompanied with heart stimulants and regulators *so as to avoid collapse* and when the ailment is not complicated and *all the quarters of the udder are free from occlusion in any way so that all quarters may be readily and thoroughly distended,* the treatment approaches the nearest to a specific of anything known to the art of medicine.

Technic

Under proper treatment it seems useless to delve into the history of the errors of the past and the slow evolution of the modern and successful treatment from the iodid of potash treatment per os; later followed by this and other solutions injected into the udder with more or less success. To those interested in this we would refer them to any of the older textbooks, most of which explain these treatments rather fully.

The technic consists solely in dilating or inflating the udder with oxygen or filtered air with sufficient pressure to reach every part of the udder, and still not use such force as to injure the udder tissue and cause the air to escape into the flank and under the skin, producing an annoying, if not a serious complication.

The apparatus most commonly used at the present time is a small cylinder packed with gauze or aseptic cotton through which the air is forced either by a bulb similar to the bulb that has been used in connection with the thermocautery for the past two decades, or a small metal pump as shown in the cut. On the other end of the cylinder is a small rubber tubing to which is attached a milk tube to convey the air into the glands.

In order to avoid contamination two things must be taken into account: (1) The cylinder and milk tube must be kept clean by either regularly boiling or immersing in a reliable antiseptic. (2) The packing of the cylinder should be replaced often enough to properly serve the purpose for which it is intended.

Some practitioners are of the opinion that the bulb inflates more rapidly and more thoroughly than the metal pump, but in my judgment it has the disadvantage that it is not dependable and may rupture at the critical moment when another bulb is not immediately available. The embarrassing effect of this is not always relieved by a veterinarian carrying an additional one in his bag, since it too may be very defective, if it has been carried long enough for the rubber to have deteriorated, even though it has done no service.

Some veterinarians resort to a pump carried to inflate auto tubes, this, however, has the appearance of an unprofessional makeshift, and we have frequently been called to treat animals where others by such methods have produced a subcutaneous emphysema practically covering the animal's entire body. When one approaches a case of milk fever it is well to place the milk tube (which may be left attached to the apparatus) in a basin containing a suitable antiseptic, thus making sure that it will be exposed to the antiseptic at least several minutes before being used. It is well to have the solution of sufficient strength to leave no doubt as to its efficiency, but it should be well diluted by adding water before being used, so as to avoid the possibility of the tube carrying too strong and irritating a solution into the teat.

The next important step is to see that the animal is effectively secured so that after the udder, flank and upper leg have been properly cleansed and the act of inflation begun, which usually causes the animal to struggle after one or more quarters are inflated, the danger of reinfecting the udder area or impeding rapid clean technic is reduced to a minimum. If attend-

ants are not available the animal should be placed on her side and the head secured; the lower hind leg drawn well out and secured, which will also be of great advantage in properly inflating the lower quarters. A rope placed around the hock of the upper leg and drawn backward and upward completes the restraint. Time and trouble consumed by this method will oftimes avoid embarrassment and criticism of particular and appreciative people who are the ones really worth while.

The whole area about the udder, flanks and hind legs should be thoroughly washed with soap and water and then rinsed with clean warm water. If clean towels are available it is well to dry off any of the surplus water and then milk out the udder. The teat ends are then disinfected. Authorities seem to differ as to the advantage or disadvantage of milking the udder perfectly dry before inflating it. My experience leads me to believe that milking out before inflating is best, as it permits of a better and more uniform inflation.

A clean towel or cloth should now be placed under the udder to guard it from rolling around and becoming soiled on the floor or bedding. With care and promptness the tube is then passed from the basin into one of the teats. The lower quarters should be inflated first, since if the animal begins to struggle, which she is apt to do after one or two quarters are inflated, her struggles will interfere less with the technic of inflating the upper quarters. It is well to have each quarter thoroughly distended so that it is drumlike.

I cannot agree with those who believe it is no advantage and not necessary to tie each teat immediately after the quarter is inflated. Experience has clearly shown me in practice where an assistant has been taught that this practice is not necessary, that the cases treated by such an assistant have always been more or less tardy in regaining their feet and the cases requiring reinflation are out of all proportion to the cases in which the ligature has been applied.

For tying the teats I prefer wide strips of strong muslin or canton flannel, say 2.5 to 3 inches wide; this is tied well up toward the base of the teat and not near the apex, and is tied absolutely tight. Instructions should be given that the bandages are to be taken off as soon as the animal rises, but under no condition to be left on longer than five hours. By this method we have never had a single case of necrosed or injured teat.

Practitioners are more or less familiar with the fact that occasionally a case, particularly those that have approached the point of death and rally rather quickly, rising or attempting to rise as promptly as some cases where treatment has been applied in the early stages, to their great chagrin and not infrequent condemnation, such animals have dropped down, giving a struggle or two, and died—plainly from what is styled heart-failure.

When we stop to consider how disturbed the circulation has been in these cases it is rather surprising that the center of circulation can possibly become readjusted as promptly as it appears to in this malady, and the wonder is that such fatalities are not more common.

To overcome this it has been our custom for years, to give a heart stimulant and regulator, beginning such medication just as soon as there is evidence of consciousness returning, or immediately if the animal is not unconscious at the time we treat her.

I prefer a mixture of strychnin, strophantus and digitalis. The dose is repeated in one hour, and again in two hours. and again in three hours, if the condition warrants it.

Since we have practiced the administering of this heart adjustor we have not had a single case of heart failure in approximately nine hundred cases. Another type of cases that in our literature seems to have received no attention, are those where one or more quarters of the udder is suffering either from acute garget, or induration or atrophy, as a result of chronic mammitis. Such quarters cannot be satisfactorily inflated and such cases rarely respond promptly to treatment.

Every effort should be made to inflate each quarter as thoroughly as possible, and the veterinarian should keep in touch with such cases since it may be necessary to repeat the inflation one or several times. The best results will be obtained where improvement is not marked, if reinflation is practiced about five or six hours apart. As a matter of fact in every case of parturient paralysis the veterinarian should either remain with the animal if it is a great distance from his office, for a time, or return and see it or get some very definite informa-

tion at different intervals, as to its progress for the first twenty-four hours after treatment. There are many minor happenings that may interfere with the satisfactory recovery that udder inflation, phenomenal as it is, will not take care of, and the veterinarian who makes it a practice to hurriedly inflate an udder and then dismiss the case, is sure to have an occasional experience that will cause dissatisfaction and regret.

Except in complicated cases cathartics, diuretics and catharterization are useless and unnecessary.

In cases where parturient paralysis sets in while the animal is in the act of calving, the fetus should be promptly removed before the udder is inflated.

Correction: Due to a typographical error made by the printer, in the March issue, Dr. De Vine was made to say "microscopical" instead of "macroscopical," in discussing autopsy findings, in his article on "Acute Indigestion in Calves." Turn to page 129, paragraph 4, March issue and make correction.

Queries and Answers

PARTURIENT PARESIS

I have had three very unusual cases of what might be called "parturient paresis," had they followed parturition.

Case No. 1. Brindle cow, Shorthorn-Jersey. Calved on June 25, 1914. The next day the animal developed a typical case of parturient paresis. She responded to the air treatment accompanied by strychnin, subcutaneously. She continued in good health until May 22, 1916, when she again went down with symptoms very similar to the first attack. She was treated as before and got up the same evening and was milked dry. The next day she again went down and was given the same treatment, but died the following day. Her calf of June 25, 1914, was her last. This was a rather unusual case, almost two years having elapsed between attacks.

Case No. 2. Grade Jersey, 10 years old. Had not calved for thirteen months. Was found down in the evening unable to regain the standing position; udder almost empty; temperature subnormal; characteristic groan, etc. She was treated with air and strychnin and was up the next day at noon apparently as well as ever.

Case No. 3. Roan Shorthorn. Calved on the morning of Sept. 16, 1915. About 11 o'clock the same morning she was found down, a typical "milk fever" case. Was treated with air and strychnin and made a complete recovery in a short time. She was bred no more, but on July 7, 1916, developed symptoms almost identical with her first attack. She was treated as before and made a nice recovery in a few hours. Kindly notice the dates in this case; also in Case No. 1.

The above cases were very interesting to me, and I would be pleased to have some of your readers in the Journal comment on them, giving name, etc. The first attack in Case No. 1 and Case No. 3 was no doubt parturient paresis, but what were the second attacks and what was the cause of the trouble in Case No. 2?—M. E. H., O.

CONSTIPATION IN CATTLE

I have had considerable trouble with constipation in cattle. The majority of cases have the symptoms of impaction of the rumen. The temperature runs up to 104° to 105.5° F.; pulse fast and strong; no appetite, and rumination ceases. Salts and oils are of no particular benefit. I have used aloin in one and one-half ounce doses in some cases, but it does not seem to help. On feeling over the rumen on the left side of the body, there seems to be a dangling mass inside. In some cases, I have removed feces by inserting my arm into the rectum as far as possible. I have also tried to massage the rumen from the outside as well as per rectum. Warm enemas of soap and water give little benefit when the trouble is so far forward. What treatment would you suggest for this trouble?—M. F. W.

Reply by Dr. J. F. De Vine: The treatment indicated in the cases described, in addition to massaging the rumen and enemas, is digestive stimulants in full doses. I prefer nux vomica, capsicum and alcohol, repeated about every three hours in conjunction with the comparatively new rumen stimulant consisting of fifteen grains each of tartar emetic and barium chlorid. This latter stimulant has added much to the therapy of bovine medicine. Previous to this we had to rely almost solely on the digestive stimulant and repeated small doses, four ounces three times daily, of sodium chlorid, with the hope of inducing the

animal to partake of a large amount of water and trusting that some of it would find its way into the rumen and assist our massaging in breaking down the mass and restoring the physiological movements. The barium chlorid and tartar emetic mixture seem to work best when all food is withheld with the exception of small amounts of succulent matter such as grass or roots, the latter being well salted to avoid any possible fermentation. A medium sized cow should be given thirty grains as an initial dose, to be repeated every four to six hours if indicated, keeping in mind that the digestive stimulant, particularly nux vomica, is a valuable and necessary adjunct. If massaging of the rumen is impracticable, moderate exercise of the animal is often very beneficial. We have frequently seen cases where a quarter of a mile walk, particularly on rolling ground, apparently hurried or assisted the action of the drugs.

PUPPIES DIE FROM DIETETIC DEFICIENCY

One of my clients is having trouble in his kennel with newborn pups. When born they are healthy and vigorous, but soon refuse to suck, cry constantly and die within three or four days. The bitches are apparently in perfect health, have no temperature and seem normal in every respect. Several litters have been lost in this manner. On April 4th a bitch gave birth to ten very large and vigorous pups. On the sixth four were dead and today (April 8th) only one is living. This remaining pup seems very vigorous now but was not so strong on the sixth. The pups do not seem to attempt to nurse after the first day. With this litter, bottle-feeding was tried on the sixth, but the pups continued to die. The bitch is bright and her temperature is normal and she has plenty of milk now, although she did not have a large quantity when I saw her last, on the sixth. I held autopsy on two pups, and in one found every organ normal. In the other, there was a marked congestion of the mucous membranes of the stomach and intestines. This kennel is one of the best in this section. The bitches have excellent care and their food is of the best. My theory is that the milk is toxic although I can find no cause for such a condition. I must admit that I cannot locate the trouble and consequently cannot attempt to prevent these losses. Any suggestions will be appreciated.—M. R. P.

Reply by DR. C. A. WHITE: Unquestionably the trouble originates in utero. That is the history of bitches that have been kept on a meat-free diet, and while the querist does not give details regarding the food of the bitches, it is suspected that meat has not been given them, or if it has, that its quantity was insufficient. Bitches in whelp should have a meat diet, not an exclusive meat diet, but some meat with a liberal amount of fat every day. Not much can be done for these puppies. The only course left is to prevent future trouble by proper feeding of the bitches at the the next breeding. Although the breed is not given, I am inclined to think that these dogs are Airedales, and in these kennels where they have a lot of Airedales, the food is quite an item, hence is usually limited to dog biscuits. It is suggested that at the next breeding, if these are Airedales or dogs of that size, one-fourth pound of meat containing a liberal amount of fat be given each day, supplemented with oatmeal and whole milk. Not so long ago, one of my clients who has a large kennel, had this same trouble among his dogs, and it was recommended that the diet be revised. Now his bitches have big litters and raise every one of them. On autopsy one will find nothing wrong with the puppies that die from the deficiency referred to, but it may be detected by making a chemical analysis of the bitch's milk. Medicinal remedies have no beneficial effects in this condition.

CONDITION DUE TO DIETARY ERRORS

Many of the dairy cattle in this section of the country have depraved appetites and continually bite the wood off the floors and stanchions. I have advised feeding charcoal with the salt, keeping it before them constantly, but this brought no visible results. I have recently recommended the use of a mixture of rock-salt, charcoal, iron sulphate, air-slaked lime and magnesium sulphate. Can you give me any criticism on this mixture or would you advise something different? Any suggestions will be greatly appreciated.—G. W. J., Ill.

REPLY: Cases such as you mention are not uncommon. The treatment formerly employed was to let them run along until the animals were turned out on grass, where there was almost spontaneous recovery.

The condition is undoubtedly due to dietary errors, which Dr. DeVine will soon discuss in the section on "Bovine Practice" in the Journal. I have heard of practitioners giving tartar emetic, two drams, and nux vomica, one-fourth dram, twice daily for such ailments with good results. Others have reported good results from the oral administration of tincture of iodine and still others from hydrogen peroxide. The tendency to spontaneous recovery with proper feeding casts doubt on the efficacy of these remedies.

Your plan to keep salt and charcoal before the animals is a good one. I believe, however, it would be best to omit the iron sulphate as it is likely to cause digestive derangements if continued.

INFECTIOUS KERATITIS

I was recently called to attend some sick sheep that were presenting the following symptoms: eyes swollen and pink; affected animals unable to see; temperature 105.5°; bowels moving normally, stools dark. They ate all of their feed, but ate very slowly. There was considerable yellowish discharge from the nose. Auscultation of the lungs was normal. At the time I was called only three animals showed symptoms, but in the course of a week the disease had permeated the entire flock. None of the sheep died, but in a flock just across the road two died from a similar complaint. Any light on this condition will be gratefully received.—C. E. B., Mich.

Since writing this report, I have posted two of the cases therein described and found the following conditions: mucous membranes of the nasal chambers injected and much thickened, slight edema of the larynx and pharynx, a few punctiform hemorrhages under the serous coat of the small bowel and the mucous membrane of the bowel swollen. The feces were very thin and bloody and very foul smelling.

Can this be a form of influenza?

C. E. B., Mich.

REPLY BY DR. BAKER: From all the symptoms described this might have been "pink eye" or infectious keratitis. I would treat it just the same as keratitis in cattle, i. e., isolation of all affected; apply zinc sulphate solutions, boric acid solutions, protargol, or in very bad cases, weak solutions of silver nitrate. I have inserted a grain of quinin and urea hydrochlorid in the inner canthus to lessen the intense pain and inflammation, applying the antiseptic solutions the next day with a small piece of cotton or an eye-dropper.

The presence of small hemorrhages suggests an atypical form of hemorrhagic septicemia, and I would suggest the use of bacterins. In fact, one can use these when he does not know what else to use, and often with surprisingly good results.

If at all possible, have a bacteriological examination made, the finding of the bipolar organisms may help, if the invasion proves to be hemorrhagic septicemia masquerading under the guise of "pink eye." Biologics should be used in sheep practice as freely as serum in swine practice. We may not understand just what we are treating sometimes, but if we get results, what more does the client want? Results are what the practitioner aims at, and if the clinician and investigator collaborates, both will be helped in the work of disease research and eradication. At present, in veterinary circles, unfortunately, too wide a gulf exists between the two. One regards the other as a "rough-neck," while the party of the second part regards the first as an impractical "high-brow." More team work is desirable, and in no branch is this more essential than in the comparatively new science of ovine pathology.

INTESTINAL PARASITISM

Recently a mare 17 years old was brought to my office with a very bad diarrhea, which the owner said had been present for more than two weeks. The horse had been eating good hay and grain; had been turned out during the day to follow cattle about two hours after they had been fed corn fodder.

The temperature was normal. I floated her teeth. The bowels returned to normal for about four days. A week later, however, the bowels were in such a serious condition that the horse got down. As I was away, another veterinarian was called and he stated that if the diarrhea was not checked shortly, the horse would die. The owner called me by phone. I told him to give two tablespoonsful of powdered alum and repeat the dose in two hours if necessary. The bowels returned to normal after the second dose. I sent him some 15-grain aluminum sulphate tablets with directions to give two tablets four times a day, and starch water to drink. This was kept up two weeks, and the animal has seemed well since the treatment was stopped.

The owner says when the horse stands in the barn over night its bowels are loose, but when turned out or driven, the passages are normal. The horse had been given one teaspoonful of salt at night. I advised that it be discontinued.

A black gelding, eight years old, with bowels loose for two weeks was given the same treatment, except that the aluminum sulphate was given in four-tablet doses every two hours. Then the owner gave six tablets every two hours until about thirty tablets had been given, with no noticeable benefit. I sent one pound of powdered alum with directions to use two teaspoonsful every hour until results were secured. I never saw this horse, but another doctor was called and in forty-eight hours the animal was dead. The horse had been sick about four weeks, was sick two weeks before any treatment was given; had been eating three good meals each day and had access to a straw stack during the day.

What is the diagnosis and what treatment should be given?—F. J. L., Mich.

Reply: The symptoms given seem to indicate that both of these cases are probably due to intestinal parasites. I would suggest as a treatment five grains of copper arsenite, continued over a considerable period. Alum is not a dependable anti-diarrheatic.

Department of Live Stock Poisoning

By L. H. PAMMEL, Ph. D., Ames, Iowa
Professor of Botany, Iowa State College

Readers are urged to take advantage of the opportunity offered by Dr. Pammel, for the identification of specimens of supposedly poisonous plants. Two good-sized specimens, carefully packed, should be sent to him direct, with such history as may be available. Simply mention that you are a reader of the AMERICAN JOURNAL OF VETERINARY MEDICINE and no charge will be made for this service.

Mechanical Irritation of Some Plants

QUITE a number of plants cause injury due to mechanical irritation. One of the best known of these in medicines is cowhage (*Mucuna piuriens*). Mechanical irritation also occurs when the awns of the squirrel tail grass (*Hordeum jubatum*) lodge in the mucous membranes of the mouth. Another type of plant like the needle grass (*Stipa spartea* and *S. comata*) also produces severe irritation. In addition to the sharp-pointed callus of this grass the fruit is provided with small hairs that do not penetrate the flesh deeply, but act superficially on the skin. Another type is represented by several species of flat-stemmed cacti (*Opuntia*), in which the innumerable small barbules are barbed in such a way that the hairs readily penetrate the skin and remain. Another type of injury results from crystals of calcium oxalate in plants that are said to be acrid, like the Indian turnip and other members of the aroid family. In a paper on "The Acridity of Some Plants Due to a Mechanical Action,"[1] E. D. Brown and D. D. Anderson, the authors, state: "The attention of one of us (Brown) having been called to an alarming condition brought about by the eating of a portion of an Indian turnip (*Arisaema triphyllum*) by a small child, it was thought it might be of interest to determine the nature of the acrid principle.

"In 1891, Weber undertook to determine the nature of the acrid principle, acting on the suggestion that the acridity was due to the raphides of calcium oxalate which are abundant in the plant and likewise in other plants producing a like acrid sensation. He selected four plants containing raphides, two of which, the Indian turnip and calocasia, were highly acrid, and two, the fuchsia and tradescantia, were perfectly bland to the taste.

"From the calocasia he was able to obtain the crystals in a pure state, while from the arum they were more or less contaminated with starch. He found it impossible to separate the crystals from the tradescantia and fuchsia owing to the large amount of mucilage present, but found the crystals in all cases to be calcium oxalate. He also found that the extract was acrid when applied to the tongue, thus confirming the observation of Enz, and seemed to corroborate the assumption that the acrid principle was soluble in ether.

"In order to determine whether this was a true mechanical action, a thin slice of the corm was carefully laid on the tongue of each of the authors and allowed to remain for five minutes after which time it was very carefully removed so as not to produce any friction on the surface of the tongue. There was no evidence of acridity experienced by either of us. The same slice of the corm was then gently rubbed over the tip of the tongue which produced the characteristic sensation. This showed quite conclusively that the crystals were responsible for the irritation and that they penetrated the tissues only when brought in contact through friction which tended to cause their penetration.

"*Phytolacca* is another drug which the dispensatory describes as containing an acrid substance very similar to saponin. Microscopic examination shows the presence of acicular crystals in large numbers, which are shorter and thicker than those found in the arum or calocasia. The fresh, dried and boiled root gave a tingling sensation to the tongue but not nearly as marked as the arum. I am informed that men employed in drug milling plants experience severe and distressing symptoms when this drug is ground. The mucous membranes are extensively involved in some cases causing total incapacity for work for a period of several days. That the condition is in all probability due to the crystals is shown by the fact that the sputum is loaded with the crystals and the bronchial symptoms clear up as the crystals disappear.

"The degree of so-called acridity is governed by the physical character of the crystals and the character of the plant tissues in which they are embedded, those plants containing the long, very slender crystals being much

[1]The Journal of Pharmacol. & Exp. Therapeutics, *12*: 37-42, 1918.

more acrid than those where the crystals are shorter and thicker.

Several of our weedy plants like the evening primrose contain these raphides or needle like crystals. These plants are generally avoided by cattle, I think, on account of the acrid principles found therein.

Proteins and Their Relation to Nutrition

The work of Dr. E. V. McCollum and his pupils on the relation of proteins to nutrition and health of animals is a most important discovery. In a recent number of the Journal of Biological Chemistry, Dr. McCollum, N. Simonds and H. T. Parsons[1] report on the value of proteins from different sources and their value for the support of growth. The best proteins for the support of growth in the rat are those of milk and eggs. The proteins of cereal grains have approximately one-third to one-half the value of the protein of milk for the support of growth or maintenance in the rat. The proteins of the pea and navy bean have apparently about one-half of the dietary value for the growth of the rat, as the proteins are deficient in one or more of the amino acids and, therefore, incapable when fed as the source of protein of inducing any growth in young rats.

HEMORRHAGIC SEPTICEMIA IN SHEEP

Continued from page 269)

to the laboratory worker, and may be the means of confusing an otherwise correct field diagnosis.

Above all things, when performing an autopsy, use precautions that give to the operation a scientific character, and prepare specimens for the microscope carefully. This will insure prompt service by the laboratory and more accurate findings. Nothing is gained by sending specimens from animals dead for some time, and the information may lead to further confusion.

These suggestions will be found valuable in any contagious disease where a bacteriological examination is desirable.

Treatment: The only logical procedure is the immunization of all exposed animals. Specially prepared bacterins of the ovine type of hemorrhagic septicemia are now available.

Mixed bacterins have been used in some cases with success.

Where lesions of blackleg are found, a dose of that vaccine also may be administered.

In outbreaks where the pneumonia symptoms predominate, immunization with the pneumo-bacterins may be given along with the hemorrhagic septicemia bacterin.

Immediate isolation of the apparently healthy from the sick and a complete change in feed, water and range is indicated. If the outbreak occurs in winter and this is impractical, run the apparently healthy sheep through a trough containing any warm antiseptic. The solution should be several inches deep, so as to disinfect the feet. One part coal tar dip to sixty of water; five pounds copper sulphate to one hundred gallons of water, or the lime and sulphur dip may be used. Scatter lime freely about the new quarters. While the organism is very easily destroyed, disinfection of the premises and then returning the animals to them will be found very unsatisfactory.

Either the axillary space or inner aspect of the thighs may be used as the site for injection of the bacterin in large bands, the sheep may be set up on the rump and quickly immunized in the axilla, or the animal may be laid on a table, waist-high, and vaccinated in the inner aspect of the thigh. By these methods, one or two thousand animals can be immunized per day by one operator with a minimum of fatigue. Short, rather thick hypodermic needles are desirable, and several syringes should be available, and frequently cleaned to prevent gumming. Antiseptic precautions are not necessary except to keep the syringe and hands clean.

In case no ovine hemorrhagic septicemia bacterin is at hand, the bovine type may be used. Should neither be available, blackleg vaccine in one-half the ordinary bovine dosage may be administered, while waiting for the arrival of the ovine hemorrhagic septicemia bacterin. However, these are merely emergency suggestions, and should be used only as a last resort.

Medicinal treatment will not be found very satisfactory. General tonics are indicated, but after immunization, comfortable quarters, abundant food and water, with sufficient exercise, will be found to be the best after-treatment.

[1]Jour. Biol. Chem., *V.* 37 : 155-178 *f.* 1-7, 1919.

Dr. D. A. Maclean, of New Orleans, who was recently appointed veterinary inspector for Mexico for shipments from the New Orleans port, recently spent two weeks in Chicago, on his honeymoon.

POINTED OPINIONS ON LIVE TOPICS by Readers of Veterinary Medicine

It is in reports like those of this department that the current history of the progress of veterinary science is written. Are you leaving a record of your experience which will help others, as you have been aided by these and other clinical reports? If not, you are earnestly invited to contribute from your experience that this department may be of the greatest service to its readers. By so doing you will earn the lasting gratitude of those who are aided by your suggestions.

Need of Clinical Training Emphasized

I AGREE heartily with the comments of Dr. John Tyler, of Pomona, Cal., appearing on page 194 of the March Journal. As he is an early-day graduate of the Chicago Veterinary College and also a graduate in human medicine, he is familiar with the methods and customs of teaching and practice in both professions, and knows whereof he speaks.

However, laboratory diagnosis has been introduced, and all the veterinary colleges and schools in the United States and Canada now offer their students more or less clinical instruction in various ways. Material and means are plentiful in some sections and scarce in others, and are utilized accordingly. Dr. N. S. Mayo says veterinary colleges and schools are undergoing a transformation from private to state institutions, and I might also add that they are undergoing a reconstruction similar to that which produced such satisfactory results in recent years in human medicine, which is yet far in advance of our profession. However, continuous reconstruction has been the experience and history of all the learned professions. The pioneers of these professions in this country were mostly self-educated or self-made men, with a fair sprinkling of college and university graduates, and as colleges and universities became organized, established and maintained and became more numerous, laws were sought and enacted for the protection of the public against imposters and incompetents. This created examining and licensing boards and thus the professions gained a better standing and legal footing, and ours was no exception and has benefited greatly in recent years.

Clinical instruction is deemed important in human medicine and many states require a year's internship in some hospital as a prerequisite for final examination and license. Dental students are also thoroughly drilled in practical clinical instruction, and occasionally take post-graduate courses which bring them greater returns in larger practices and increased fees. Cattle condemned under the tuberculin test or incapacitated because of abortion or sterility or chronic lameness or inability to work could be utilized for clinical demonstrations for the benefit of students. The results of these experiments could be recorded and published in book form for the benefit of recent graduates. The M. D.'s record and publish a series of clinical case reports in book form, annually, from the large hospital centers, but veterinarians have not yet adopted these methods except in periodicals and college reports.

The "Mayo Bros. Clinics," published at Rochester, Minn., illustrate what earnest, competent men can accomplish even in a small village remote from large hospitals and educational centers, and I believe that a veterinary ambulatory polyclinic could be organized, established and maintained somewhere in this country for the benefit of qualified students and recent graduates. I have given the matter considerable thought for several years and may attempt to put it into practice. I believe that we should be able to formulate some plans whereby advanced students can be enabled to work with, and take clinical instructions under approved and qualified practitioners during vacations, and thus receive allowances and time credits toward graduation. This would enable students of mature years to complete their college course in three, instead of four years, or by additional work and a four-year course secure additional credits that might be applied toward a degree in public hygiene.

General practitioners in the vicinity of colleges could be employed as adjunct professors and clinical instructors in actual practice. Experimental surgery on narcotized animals, later destroyed, is similar to demonstrations on the cadaver, as there is no opportunity to apply therapeutic treatment and observe the results as in actual practice.

The United States army and navy maintain post-graduate schools for recent medical appointees, and it seems reasonable that the Bu-

reau of Animal Industry, United States Department of Agriculture, should establish and maintain similar institutions. Great Britain offers advanced courses in instruction and degrees in public hygiene and I believe every appointee takes advance courses in certain schools and colleges.

Sanitary science occasionally suffers in this country through political appointees lacking thorough clinical training, especially in contagious and infectious diseases. Consult our government records of losses of live stock from preventable diseases.

This country has produced Hoskins, the greatest association worker in the world; Williams, the leading teacher in surgery, obstetrics, and diseases of new-born animals. Who will be our clinical teachers?

I see the shortcomings of the men who call me in consultation, and where live stock owners call me in after other veterinarians have failed. Just last night I saw a female fox terrier to which another veterinarian had given Russian white oil, making it much sicker. An amputated vagina required attention later and removal of retained stitches.

Figure out the percentage of professional graduates of the colleges and universities in this country who abandon their profession shortly after graduation, the cause (if ascertained) would make interesting reading.

We all learn clinical medicine and surgery much the same as dancing and singing are learned, through continued experience and practice.

Pittsburgh, Pa. JAMES A. WAUGH.

FAVORS TRAINING UNDER COMPETENT PRACTITIONER

Regarding better clinical training for the young man coming out of college, it seems to me that this is one of the vital questions just now confronting the profession at large. We have persistently hammered away until we have succeeded in getting the preliminary requirements up until they are at least in sight of the goal, but how about what we are giving in return for this high achievement on the part of the student.

The time was when our practice was largely equine; our college hospitals were crowded with equine patients and the training was such that the student was sent out by his alma mater fairly well equipped and qualified to render good service in the line of practice which was largely his.

Now, with the decline of equine practice in the cities where the colleges are located even this line of training is cut off and the young graduate finds himself badly handicapped in handling even this line of practice which is far more plentiful in the country than in the city, and his knowledge of the diseases and other ailments of cattle, hogs, sheep, goats, etc., from first-hand observation is practically nil, other than what he has gained from didactic lectures and charts.

A friend of mine with a large city and country practice has for several years required the services of an assistant, but his experience with the young men who came to him was such that he was forced to forego their employment and take care of all the practice himself that he was able to and let the remainder go. They were all bright, well educated, willing young men but they showed a woful lack of clinical training. In other words, their education was not complete. I have for some time held that one of the requirements for graduation should be a certificate from a reputable practitioner whose ability and integrity were vouched for by the college showing that the student had spent his intervening months between courses in practical training with said practitioner who should be thoroughly investigated and placed upon the accredited list by the colleges so that he too could meet the faculty requirements. The indiscriminate selection of their preceptors by the students themselves should be discouraged. The student should not be allowed to spend his time with "old Doc. So and So" in his home town, just because he is handy and a good fellow. Merit only should be considered.

Perhaps my remedy is impractical, but that there is a need for improvement is very evident to the rank and file of the general practitioners throughout the country. Many of the young men themselves recognize their deficiency and soon take the civil service examination and enter the government service where with a short training they pass as experts and specialists along certain lines evidence of their native ability and that with proper clinical teaching they would have made competent practitioners.

This takes me back to the days when I was in medical college where I exhibited special qualifications for a certain specialty and I was moved to consult the professor of this branch as to the advisability of my entering this line of work upon my graduation, and I well remember his advice, which was to the effect that I might succeed but that the chances were against it as the successful specialist was the one who had gone through the training course of not less than ten years of general practice before embarking in any specialty, and during that time studied conditions in general and his future specialty in particular. I would like to see this question discussed thoroughly in the Journal, as I consider it very important.

Some states now require of their applicants for appointments as assistant state veterinarians or other sanitary offices, a certificate showing a number of years in general practice, for which a liberal allowance in credits on their grades is made.

On the other hand, the age limit is too low. Men from 45 to 55 years of age, everything else being equal, are equipped to render the best

service of their lives to their states and the nation, and many of them would be glad to relinquish general practice and devote their time and the result of their experience to sanitary work even if the financial returns were less than in general practice. It is folly to hold that the man of fifty who has kept abreast of the times is not a better man in his profession than he was twenty-five or thirty years ago, Osler notwithstanding. I believe it, otherwise our colleges would need a house cleaning.

JOHN L. TYLER.

Pomona, Cal.

PUBLIC HEALTH VS. "PRIVATE INTERESTS"

In the May, 1919, issue of the Journal, I note that Dr. John R. Mohler, Chief of the Bureau of Animal Industry, writes:

"It is difficult to understand why, even though an individual might consider that his private interests were being somewhat jeopardized by a public work, he would withhold any assistance he could proffer for the uplift and improvement of his fellow professional worker."

Are the following facts a mere supposition that my interests were jeoparized?

It is a matter of court record, as testified to by the Commissioner of the Massachusetts Department of Animal Industry, Dr. L. H. Howard, that records show that March 23 and 24, 1917, at Barre, Vermont, two cows No. 32382, and No. 32384 (ear tags) were tuberculin-tested, passed as free from tuberculosis, and came to Massachusetts. The cow, ear tag No. 32382, Vt., was killed by order of the commissioner, April 24, 1917, and the postmortem records are "generalized tuberculosis," and the compensation for cow No. 32382, Vt., was $40.00.

I tested cow No. 32384, Vt., using the intradermal method, May 1, 1917, which gave a positive reading. May 7-8, 1917, the records show that the subcutaneous test was made of cow No. 32384 by Dr. G. W. Bickell, an agent of the Department of Animal Industry.

May 24, 1917, Dr. W. T. White testified as an agent of the Department of Animal Industry that at 6 p. m. he applied the opthalmic test to cow No. 32384.

May 25, 1917, Dr. W. T. White at 6 a. m. injected 4 c. c. tuberculin in cow No. 32384 and began the reading and recording of the temperature at 12 noon. The last reading and recording was 8 p. m. of May 25, 1917.

June 6-7, 1917, Dr. George R. Caldwell, employed by the federal government, made a subcutaneous tuberculin test of cow No. 32384 and the report was negative.

The Board of Health of Lawrence, Massachusetts, and myself agreed to abide by the subcutaneous tuberculin test to be made on cow No. 32384 by the federal government.

It did not occur to us that the subcutaneous tuberculin test would be made for the third time within 30 days. The rule as recorded by the federal government, is that at least sixty days must elapse after the previous test.

The action of the Bureau of Animal Industry jeopardized the health of eight children to whom the milk was to be fed, a far more important fact than any personal interests of mine.

I do not believe for a moment that the action of the Bureau of Animal Industry was intentional.

The postmortem examination of cow No. 32384 revealed ascites, tuberculosis of the lung and lymphadenitis, as well as a histological report of lymphosarcoma (Mallory).

It should be obvious that my interest in this work forbids any antagonism of governmental or individual work along this line.

J. F. WINCHESTER, B. Sc., D. V. S.

Lawrence, Mass.

NEW ORLEANS THE MECCA FOR 1919

The American Veterinary Medical Association will hold its 56th annual meeting in New Orleans, November 17 to 21. Five glorious days of recreation and education in one of the most historic cities in the United States. It is the "Winter Capital of America" and tourists from all over the continent may be daily seen on its thoroughfares.

New Orleans is a city of about 400,000 population, located at the lower end of the Mississippi River, approximately 100 miles from the Gulf of Mexico where the "Father of Waters" ends its journey and becomes part of the ocean. The city is rich in points of interest.

Points of Historic Interest

The Napoleon House, erected in 1821 by Nicholas Girod, then mayor of New Orleans, for the purpose of ultimately furnishing a permanent home for the Imperial prisoner, in case a few chosen Barataria pirates could rescue him from St. Helena.

The John McDonough residence, which stands as a memorial to all school children. McDonough, in his early years, about 1800, was disappointed in love because of his inferior social and financial position. Subsequently he married but firmly resolved that some day he would have more money than all the aristocrats put together and his name would live long after their proud titles had been forgotten. He became a miser and hermit with only one ambition—that of amassing money. In 1850 he died, bequeathing his immense fortune to the cities of New Orleans and Baltimore for educational purposes, with

the proviso that the little children of the public schools should, once a year, strew his grave with flowers.

The St. Louis or Royal Hotel, which stands in the heart of the French quarter, was erected in 1835 at a cost of $1,500,000, destroyed by fire in 1841, but again erected at a great cost. It was the resort of wealthy southern planters who were the largest slave-holders. The rotunda was a slave mart and the names of the auctioneers are engraved on the walls. Henry Clay was entertained in the building at a cost of $20,000.

The Haunted House was occupied in 1813 by Mme. Lalaurie, who was a cruel and brutal slave-holder. She was subsequently forced to flee to France. Many slaves were left chained in the building and after her flight a mass of human bones were found scattered over the floors. It is said that ghosts of the murdered and starved slaves can be seen on dark and stormy nights.

Another historic place, but now serving a modern purpose, is the St. Charles Hotel, which was erected in 1835. The rotunda was world-famed. In 1851 it was destroyed by fire, but rebuilt in 1852. In the parlor, Jefferson Davis met a number of politicians on his way to the Charleston convention in 1860. In 1862 General Butler was refused accommodations which caused some disturbance, but finally he succeeded in gaining his point. In 1865 a large number of impoverished confederate soldiers were entertained free, the bills amounted to over $30,000 and no attempt has ever been made to collect them. The building was again burned in 1894. Immediately from the ruins sprung the present structure.

Scores of other historic places might be mentioned, but upon arrival in the City of Palms, guides and literature will be at hand to provide a continuous round of pleasure, when the convention is not in session.

This is the first time in twenty-two years that the association has met in the South, the last meeting having been in Nashville, Tenn., in 1897. Since that time many changes have taken place, and the veterinary profession has expanded so that its usefulness is felt in every section of the United States and Canada. The fact that the convention will be in New Orleans, and at a time of year when the climate will be ideal, should induce every qualified veterinarian in America to attend, and those who are not members will miss a golden opportunity if they do not take advantage of the occasion to identify themselves with one of the greatest sanitary organizations in the world. From all reports, this is going to be one of the largest and best meetings ever held, and the program promises to be of unusual interest.

The ladies, who hold the balance of power in all social functions, should make this the climax of the season, and the writer, in behalf of every member of the association, wishes to repeat the cordial invitations of the past and urge them to attend this meeting. If they come they will never forget the splendid reception which will be tendered them. The local committee on entertainment is arranging for them, to the end that every moment may be full of pleasure. The presence of ladies always adds charm and tempers the atmosphere with a spirit of kindly feeling toward all.

E. I. SMITH,
Secretary-Treasurer and Chairman Arrangements, Louisiana Veterinary Medical Association.

COUNTY AGENT MISTAKES COSTLY

The fact that the county agent has been cussed and discussed, makes me surer than ever that there is something which we veterinarians have overlooked, or at least I have seen nothing in the Journal covering my views on the county agent problem.

It is stated by some that the agent has come to stay, but this I cannot believe for the simple reason that our agent (like many others) has cost our county more in the last year and a half than his salary for five years. Why? He will go out to a farmer's place, look over the sick animals and vaccinate for blackleg when they have hemorrhagic septicemia. The results you know. The next place he visits he will vaccinate for septicemia without results where the animals have septicemia. Why? I will leave you to answer.

Another example of his activities is shown in a case where he saw a bunch of two hundred four-year old steers, that had septicemia of the cutaneous type. He told the owner that they had septicemia of such a type that vaccination or other treatment would be useless. After ninety-six animals had died the owner came to see me and in a few minutes I secured his consent to vaccinate, after which not another animal was lost.

I ask you, is the present-day intelligent farmer going to stand for this kind of a deal and pay 25 cents a dose for the vaccine which the agent tells him is its cost and tnat he charges him nothing for the administration? I answer that he will not and that when he comes to himself he will do all in his power to overthrow the agent. As further proof of this, I would cite the fact that two of our counties have already abandoned their county agents.

On page 260 of the May Journal, Lieut. Conn tells us to "get acquainted with our agent, you may like him." I regret that I have never met the kind of an agent that he describes. I have met and known a good many county agents in this state, but have yet to meet one with judgment and good sense enough to stay on his side of the fence.

My short experience in the army proved to me one thing, and it is the one thing that is causing the trouble with the agent and (if there be any) the B. A. I., and it is also the answer to the question, "Why did veterinarians go as privates when all the M. D.'s went as officers?" The answer is, the government does not realize the true value of the field veterinarian, for if it did it would let him make accredited herd tests and would not allow the county agent to use biologic agents and do veterinary work as he now does.

What will we do? Go into politics and do dirty work, make and pass laws which will let us in on the pay dirt?

PHILLIP T. SMITH, D. V. M.

Ogallala, Neb.

FRACTURE OF THE OS PEDIS FOLLOWING RECOVERY FROM NAIL PRICK

Some months ago a black draft mare picked up a nail in the street with the left hind foot. The nail entered at about the toe of the frog and went in to the bone. It appeared to yield nicely to ordinary antiseptic treatment, and the mare went to work after a week. She worked for about a week hauling coal, and when hauling a heavy load she suddenly went dead lame and never put the foot to the ground again.

She was brought to the hospital in an ambulance, and refrigerating antiseptic treatment was given. When making a forcible circular incision at the old wound, I ruptured the humeral attachment of the coracohumeralis, which laid my right arm up for three months. In the meantime the mare continued to grow

Fracture of the os pedis caused by nail puncture.

worse and was finally destroyed, diagnosis having been made of fracture of the os pedis. On postmortem examination, in boiling out the foot, the diagnosis was confirmed as shown by the accompanying illustration, which also shows a little necrosis of the os pedis near the toe where the nail entered. The presumption is that in a forcible effort while the horse was hauling a heavy load, the coffin bone split into two pieces.

Chicago, Ill. A. H. BAKER.

BICORNUAL PREGNANCY IN A MARE

An aged mare that had given birth to a number of colts, unassisted, showed symptoms of parturition and was placed in a box stall where an attendant watched her and was ready to assist in case any difficulty arose. After several hours of waiting no symptoms of delivery were noticeable and examination showed that only one foot was presented, and as the remainder of the body could not be located by the attendant, the owner was informed of the condition and advised that assistance would probably be necessary.

Upon my arrival I found the mare lying in a natural position making feeble attempts at expulsion at long intervals. Examination revealed that one fore limb was presented in the vagina, and on searching for the other a very long and narrow vagina was found. This passage extended forward almost an arm's length and then turned downward very abruptly. The fetus, which could not be felt, except through the uterine walls, appeared to be lying below the pubis and somewhat to the left of the pelvis. Owing to the thickness of the vaginal and uterine walls it was impossible to determine the exact position in which the body laid. After several exhausting attempts to locate the other limb and parts of the body without success, traction was applied and further examination made. The other knee and superior part of the metacarpal bone could now be felt with the finger tips at arm's length. After diligent and exhausting manipulations the retained limb presented. No other portion of the body could be felt as the vagina extended forward too far. Traction was again applied in an effort to reach the body, but the limbs obstructed this work considerably. In repelling them the body was pushed into such a position that it could not be reached. It was decided that amputation would be a serious handicap to delivery. After long and exhausting trials of various kinds the inferior cervical vertebrae could be felt, and an attempt made to place a sharp hook into them so as to bring the body back far enough so that a rope could be placed about it, but in vain. While endeavoring to secure some sort of a hold on the neck the mare strained violently, resulting in the protrusion of the intestines. Convinced that there was no hope for the animal she was destroyed.

Owing to my exhausted condition and the lateness of the hour, an autopsy was not held at the time. I planned to call the next day for an autopsy, but the roads were in such horrible condition and the farm so far from town, that I decided to forego the autopsy rather than return over the terrible roads.

This was the second case that I have en-

countered in my practice, the first being in a cow, which was not so difficult to deliver and the animal was saved. In thinking over the case above reported I wondered if there might have been some method of placing the colt in position for presentation that I had omitted, and consulted the various textbooks on obstetrics, to satisfy myself that I had done all it was possible to do in this case. After reading, "Williams Obstetrics," pages 501-511, I was satisfied that I could have done no more, as he considers it a very serious presentation and cites a number of cases in which the results were unfavorable.

Williams, Ia. W. P. BOSSENBERGER.

SUCCESSFUL CESAREAN SECTION

This is the time of year when the genus suis delivers its offspring. We never before lost so many sows in this territory as we have this year. The impassability of the roads must stand the blame for the inability of the farmer to secure veterinary assistance. I am glad to report that without exception when a veterinarian was called in time there was practically no loss through the use of either pituitrin or the cesarean operation.

I was recently called to a case and it took me more than an hour to reach the farm, a distance of six miles. The driver and I were on a "turkey trot cadenza." At times we were forced to pull the wheel out a rut, sunk to the hub. On arrival at the farm, I found a beautiful Chester White sow moving about in the pen. The owner told me he had lost a sister of this sow the night before. A neighbor had assisted him in delivering the pigs, but the mother died.

I injected pituitrin; cleansed the labiæ thoroughly and my hands also. Manual exploration revealed the tusks of the fetus, but delivery seemed impossible. The owner suggested the use of forceps, but I told him I did not approve of their use. It was necessary to decide and act quickly. I am a "Merillat man" and believe in the use of the knife whether in a cow, a mare or the mother of Julius Cesar. The field was cleansed with tincture of iodin, and the skin, adipose and muscular tissue cut with two strokes of the knife. The horn of the uterus was exposed and a two-snouted head with three eyes exposed, the remainder of the body was that of a normal pig. It was dead. Two normal live pigs were delivered also. After removal of the fetal membranes, the two horns were stitched and the opening closed with deep sutures. The operation was performed April 9th. The sow was well and ready for the market at the time of writing, May 5th.

Fairfax, Minn. S. J. ALCALAY.

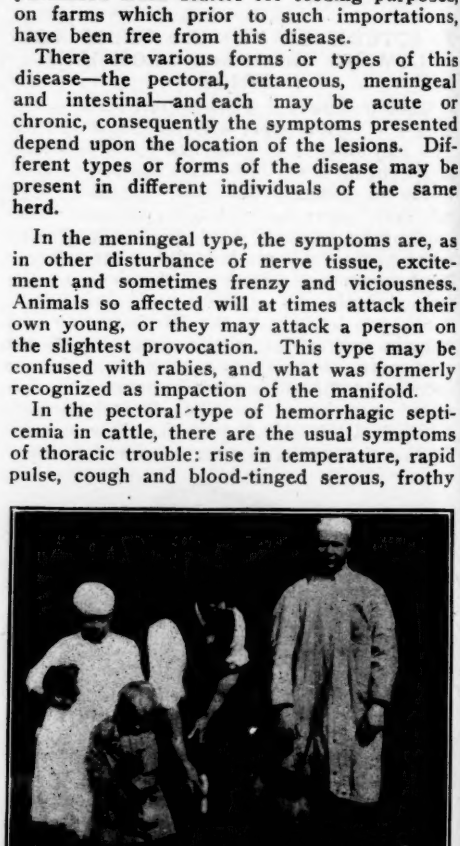
OBSERVATIONS IN OUTBREAKS OF HEMORRHAGIC SEPTICEMIA

Hemorrhagic septicemia in cattle has been found in nearly every state in the union, and is more prevalent in the middle western states than is generally supposed. It is a specific infectious disease and the causative factor is the B. bovisepticus belonging to the pasteurella group. It has been held by some that cattle have carried the disease from the stockyards to other susceptible cattle and still remained healthy themselves. The prevailing belief, however, is that this bacilla gains entrance through the digestive and respiratory mucosa. Some of the outbreaks under my supervision have followed the addition to herds of stock purchased from dealers for feeding purposes, on farms which prior to such importations, have been free from this disease.

There are various forms or types of this disease—the pectoral, cutaneous, meningeal and intestinal—and each may be acute or chronic, consequently the symptoms presented depend upon the location of the lesions. Different types or forms of the disease may be present in different individuals of the same herd.

In the meningeal type, the symptoms are, as in other disturbance of nerve tissue, excitement and sometimes frenzy and viciousness. Animals so affected will at times attack their own young, or they may attack a person on the slightest provocation. This type may be confused with rabies, and what was formerly recognized as impaction of the manifold.

In the pectoral type of hemorrhagic septicemia in cattle, there are the usual symptoms of thoracic trouble: rise in temperature, rapid pulse, cough and blood-tinged serous, frothy



Sow after cesarean section had been performed by Dr. F. E. Ward and sons at Terre Haute, Ind., after she had been in labor all day, during which one pig's body was entirely severed from the head which remained in the uterus. The animal was then taken in a wagon to a hospital and operated upon at eleven o'clock at night. Dr. Ward reports that the sow and pigs are all doing nicely.

nasal discharge; the animal is found apart from the herd usually standing with back arched; it moves with stiffened gait.

The intestinal type sometimes shows symptoms of abdominal trouble. There may or may not be blood-streaked feces and diarrhea with high temperature and changed pulse rate, and occasionally in this form there are large serous swellings and ruptures, and even protrusion of the paunch on the inferior portion of the abdomen in the living animal.

The cutaneous form may often be mistaken for blackleg or malignant edema. The lesions of forage poisoning sometimes closely resemble those of hemorrhagic septicemia and can be differentiated only by laboratory examination and demonstration of the presence of organisms of the disease. The same is also true in the differential laboratory diagnosis of hemorrhagic septicemia (meningeal form) and rabies.

From a series of 18 infected farms, I have selected one type of hemorrhagic septicemia peculiar to that farm and will briefly give my observation thereon.

No. 1. PECTORAL TYPE. Farm near Nora Springs. The owner lost seven head, mostly young stock. He stated that the disease appeared suddenly. The animals would go off feed for a few days; could not drink; badly tucked in flanks. Some apparently went crazy; would butt other cattle, run and bellow. The sick animals were badly emaciated; showed evidence of laryngeal paralysis. Autopsies on this farm revealed conclusive evidence of hemorrhagic septicemia; the organisms were isolated from material from these cases that was sent to a laboratory. Examination of the brain failed to reveal negri bodies. The herd was treated by the intravenous injection of serum, prepared at the laboratory at Ames. Seven more animals were lost, after which the symptoms abated. Extensive postmortem examinations revealed mostly the pectoral form of the disease. There were zones of inflammation and hemorrhagic areas throughout the air passages and in the lymphatic glands and endocardium and in the convolutions of the brain.

No. 2. MENINGEAL TYPE. Farm a few miles southeast of No. 1. The lesions in a heifer autopsied there revealed about the same pathological changes as the postmortem examinations at farm near Nora Springs, except that they did not appear to be quite so extensive. There were some hemorrhagic areas on the upper part of the heart and on the endocardium. A sheep in a pen on this farm was performing some very extraordinary antics. It would butt at objects and even attempt to bite its own forelegs and flanks. It was a very interesting case, and it was agreed among the veterinarians present, of whom there were several, to have the animal shipped to Ames for further investigation. It was crated alive but somehow reached Mason City, instead of Ames. I was later informed by the state veterinary department that negri bodies had been demonstrated in the brain of that sheep; if true, it is the only case in which negri bodies could be demonstrated from any lesions in the entire affected district. It had been repeatedly demonstrated at the laboratories at Ames, at Iowa City and at Kansas City, that all outbreaks in this locality, with this exception, could be traced to the hemorrhagic septicemia organisms.

No. 3. CUTANEOUS FORM. Herd of Hereford calves. These calves were vaccinated by a veterinarian for the prevention of blackleg one week prior to my visit. The symptoms and postmortem lesions very much resembled blackleg. Eight animals died subsequent to blackleg vaccination; the bipolaris organism was isolated at the laboratory at Ames and by Dr. Kinsley at Kansas City.

No. 4. INTESTINAL FORM. This was perhaps the most interesting outbreak in the entire district. It was brought to my notice by Dr. W. J. Gooder, Osage, Iowa, and after consultation it was determined that we undoubtedly had hemorrhagic septicemia to deal with. The symptoms and postmortem findings appeared so conclusive that it was not deemed necessary to send lesions to a laboratory. Serum and bacterin were wired for at the beginning of the outbreak. There were 80 head in the herd, and at the time of my visit seven animals were already dead and three others were in a dying condition. The owner stated that his cattle were well until turned out into shock corn which had stood in the field all winter. They were in this field only three or four days when they developed symptoms of diarrhea and dysentery. The owner attached no importance to the fact that 39 black polled steers had recently been added to the herd for feeding purposes, because the disease attacked the stock which had been raised on the farm or had been there for six months prior to the outbreak.

The intestinal type predominated. Between our visits, four animals developed ruptures in the ventral region of the abdomen. Later on a steer (dead) showed protrusion of the paunch on the ventral surface of the abdomen. the size of a three-gallon bucket. Another steer was moving around slowly with the paunch protruding and the contents escaping on the ground. When we vaccinated this herd, 15 animals had died, and about 25 others were showing temperatures, and were in various stages of the disease. These received serum. The remainder of the herd was given bacterin. Of those that received serum not more than 15 animals were decidedly affected; only a few were very sick and apparently hopeless. At the final clean up there were 30 dead animals

the remainder of the herd being in perfect health.

CONCLUSIONS. Medical treatment was not tried; early vaccination seemed effective. The differential diagnosis in the field, of some types of hemorrhagic septicemia is extremely difficult.

J. H. MCLEOD.

Charles City, Iowa.

HEMORRHOIDS IN THE DOG

By hemorrhoids, or piles, is meant a morbid condition of the blood vessels of the anus, and the lower part of the rectum, especially the veins of the submucous, and subcutaneous areolar tissue, and characterized by diffuse, varicosed, intumescence, and unnatural tortuousness, which may or may not be attended with a discharge of blood. Piles are termed open or blind, according to whether they bleed or not, or as internal or external, according to their location above or below the edge of the anus, the former being always within the gut itself, and the latter protruding from the anal aperture. The latter are always blind, but both may coexist in the same animal. This is a common affection in the dog, but I have never seen it in the cat.

A peculiar arrangement of the veins of the rectum directly predisposes to the occurrence of piles, on account of the freedom from valves. And another great cause in the dog is the lack of support to the veins of this plexus, on their mucous aspect during defecation.

Age exercises considerable influence on the occurrence of piles. The disease occurs with nearly equal frequency in both sexes, but occurs more frequently in old, fat animals (pugs, spayed bitches, etc.). Among the exciting causes are lack of exercise, the use of drastic purgatives, more especially aloes, etc., constipation, confinement, over-stimulating foods, straining in the act of defecation, proctitis, etc., or any condition leading to stasis. Lack of exercise or excitement of the generative organs have been known to cause piles.

The dog's rectum is peculiarly exposed to disease: first, because of his natural tendencies to constipation, he strains forcibly in the act of voiding feces, and secondly, because he swallows many things of an indigestible character that pass into the rectum and cause local irritation or other injury. The most direct causes of piles are retardation of the return of the portal blood, and impediment to the onward current of the blood through the hemorrhoidal or mesenteric veins, habitual constipation, the accumulation of hardened fecal masses in the large intestines; lack of sufficient secretion from the mucous surface; hindrance to the proper action of the liver, and resulting congestion of that organ.

External hemorrhoids when small and of recent formation do not, as a rule, give rise to much distress in the dog, other than itching, heat, etc., but when large and indurated by inflammation, or when irritated, they cause considerable suffering, followed by loss of health and emaciation. The pain is increased when the animal runs or goes up stairs, causing the piles to protrude, and appear as dark purple, soft, vascular tumors.

Internal piles are usually attended by heat and itching about the anus. This is occasioned by the piles and condensed mucous membrane to which they are attached being protruded during the strainful expulsion of the feces, and not returning quickly enough, they are grasped by the sphincter ani and constricted. Digital examination is very painful and the animal will resist to his uttermost, and flatulence will be noticed.

Among the first symptoms noted are feces tinged with blood and a tendency of the animal to rub the anal region by pulling itself along in a sitting position. The hemorrhage varies greatly in quantity; at first there may be only a few drops falling after passage of feces, or the cylinder of the feces may be stained on one side by streaks or spots of blood, and if profuse and occurring at short intervals, its effect may be alarming. However, when moderate in quantity and short in duration, it is often a source of relief to the animal; but if a large quantity of blood be lost at one time, or if the hemorrhage continues for too long a period, great debility ensues. More harm is usually done by its long continuance than by its excessive quantity. The animal may become debilitated and anemic, and syncope may result. Piles in the dog are not uncommonly complicated by fissures, fistulae, prolapsus, prostatitis, polypus, cancer, etc., and must be correctly diagnosed, or differentiated from the above affection before relief can be expected.

In the treatment of piles in the dog, the animal should never be allowed to become constipated, mild aperients should be used if necessary, but the animal should not be purged. The affection should not be regarded as a disease, or local affection, merely requiring manual treatment, but as a symptom, or rather an effect, of remote visceral obstruction and disease, the removal of which may be sufficient to accomplish a cure, without the necessity of local treatment. Should it be necessary to have recourse to operative procedure, it should be secondary to the removal of those conditions that have primarily occasioned the congestion and dilation of the hemorrhoidal vessels. However, in some cases a surgical procedure is the only sure and permanent relief, followed by thermocautery. The diet of the animal should be nutritious. Violent exercises, highly seasoned foods or over-stimulation are to be avoided.

In a majority of instances, however, piles in

the dog are associated with a plethoric state of the system, and obstruction of the abdominal viscera. In certain plethoric animals there is swelling of the veins and arteries, congestion of the mucous membrane resulting. Efforts should be made to remedy the plethoric condition by putting the animal upon proper regimen, lessening the quantity of food given. In all cases of piles in the dog, but more particularly in those arising from hepatic obstruction, mild aperients are of benefit, removing feculent accumulations, and establishing a free secretion from the intestinal surface, they tend materially to prevent congestion of the portal system. The following will be found to be of great service:

Olii ricini ..... ʒiv
Tinct. senna comp. ..... ʒii
Misce. fiat haustus.
Sig. Give occasionally as needed.

The local treatment of piles is also important. The parts should be sponged with cold water, morning and night. If there is much relaxation, and the piles be internal, benefit may result from the employment of some astringent injection, such as a very weak solution of iron, or the tincture of the sesquichlorid, a grain of the first, or ten drops of the latter, to an ounce of water; of this about two ounces may be injected every night. The following may be given internally, if the bowels are in a proper condition:

Tinct. ferri chlorid.
Tinct. opii ..... aa....ʒss
Inf. cetraria islandicae.
Inf. gentian comp. ..... aa....Q.S....ʒviii
Misce.
Sig. One-half to one tablespoon full every four hours.

The application of an astringent ointment, or lotion, such as the following, or the employment of an anodyne and astringent suppository, will be attended with much benefit:

Tannin ..... ʒi
Glycerin ..... ʒi
Aqua destillata, ad. lib.
Misc. fiat lotio.
Sig. Apply once or twice daily after washing the parts with cold water.

Pure glycerin dissolves nearly its own weight of tannin, thus forming a very powerful local astringent, readily miscible with water. The solution of tannin in glycerin, properly diluted, is peculiarly applicable to many disorders of the mucous membranes, as it readily combines with mucus, and forms a non-evaporizing coating over the dry membrane; hence may be applied with benefit to the mucous membrane of the eye, ear and rectum in many diseased conditions. The solution should be kept in the dark, and not prepared long before it is needed (Bayes):

Acid tannic.
Opium ..... aa....ʒi
Adepts ..... ʒi
Misce. et fiat ointment.
Sig. Apply twice daily after washing with cold water (Finlay Dun).

Pulv. gallae ..... gr. xx
Pulv. opii.
Plumbi acetatis ..... aa....gr. x
Lani.
Petrolati ..... aa....ʒiv
Misce. et fiat unguenti.
Sig. Apply twice daily after washing parts with cold water.

New Haven, Conn. OSCAR SCHRECK.

BEZOAR OR CALCULI OBSTRUCTION

A sixteen-hundred pound gelding was brought to the hospital with the order to dress his teeth, as he was not eating very well. His pulse was normal; temperature and respiration denoted a healthy condition. Nothing of consequence was found wrong in the mouth. The teeth were dressed, and as the owner was about to lead the horse out, he remarked that he hoped the horse would be able to eat something now as he had not eaten anything for a couple of days. On examination I found a complete absence of peristalsis, and the owner reported no feces had been passed by the animal for two days.

The horse was given a quart each of white rose petrolatum and linseed oil, and half a grain arecolin hypodermically. A three-gallon enema brought no results. Slight uneasiness and peristalsis in the small intestine followed the hypodermic injection, but there was little evidence of pain. Daily enemas and oil were given until six quarts had been given during a period of sixteen days. The horse was taken out and led about. He seemed to feel good and played with a horse in an adjoining stall. A small quantity of mash with hay was given after the fourth day. The small intestine gave some evidence of action, but not a particle of feces came from the large intestine although copious enemas would be retained. On the morning of the sixteenth day, I found him standing with a cold sweat covering head and neck; membranes blanched; and in five minutes he dropped dead with no evidence of suffering.

On postmortem, feces of bovine consistency were removed, and the intestines traced, in situ. At the diaphragmatic flexure of the large intestine we found the rupture and the cause—a calculus weighing two pounds and ten and one-half ounces. About thirty inches back from the flexure was a round depression where the calculus evidently had been lodged and gradually collected the accretions. It was found that the horse had been used in garbage hauling and being driven without a check line, had been in the habit, during idle moments, of collecting samples of the debris within reach. In the deposit were found black dirt, cinders, and a piece of china with a calcium-like crust at intervals.

The interesting feature of this case to me, was the length of time the animal lived with this complete obstruction without evidence of pain.

Chicago, Ill. JAS. R. ROBERTSON.

PLANT POISONING SPEEDLY CURED

May 1st I was called to see a Jersey cow which the owner said was crazy. Examination disclosed the heart very feeble; edema of eyelids; general depression; animal unable to see; wandered about incessantly, butting its head against any obstacle in its path; cerebral anemia.

Diagnosis: plant poisoning, nature of plant unknown to me.

Treatment: Ten mils of sterile camphorated oil, subcutaneously, to stimulate heart, circulation, etc.; one lb. magnesium sulphate, orally, to empty intestinal tract; 20 mils potassium permanganate solution as antidote for plant poison. The latter was given in two injections, subcutaneously. The animal appeared normal the next day and made a nice recovery.

Hotchkiss, Colo. J. A. BESTALL.

LAMENESS FOLLOWING INJURY

April 1st, while on another call, a penurious gentleman about nine miles from my home asked me to look at a lame horse he had. The patient, a cream-colored stallion, the owner informed me, had slipped on coming out of his stall, not a very steep one, and sprained his leg. Of course, he had not had much difficulty in diagnosis as the injured part was plainly visible, which on examination proved to be in the hollow of the heel and under the lateral cartilage on the under side of the off fore leg. The parts were hot, swollen, tender and painful, and the animal hobbled along on three legs.

I could not call it a quittor as there was no sinus wound, but I told him quittor was threatened and the probable consequences of abscess formation, etc.

Of course, he had called into use the time-honored oil meal poultice the day before I happened to pass, but the careless manner in which it had been applied made it practically useless.

Treatment: Hot fomentation for an hour at a time, three times daily. After each fomentation the following lotion was applied on cotton wool and bandaged in place.

R—Plumbi Acetatis	5i
Tr. Arnicæ	
Spts. Camphoræ aa	3vi
Aquae ad	3xxiv

Apply one ounce in two ounces of water on cotton wool saturated, and bandage.

About a week later, I saw the horse walking normally, but slightly tender on uneven ground. The swelling and pain gone; no abscess formation; slight oozing of serum. I prescribed a biniodide of mercury blister to hasten resolution. I met the owner a few days later and he said he had lost the prescription, but I am sure he was not telling the truth. A week later I met him riding in a cart to which the horse was hitched, apparently free from lameness.

I do not think it was a case of sprain of the posterior ligament of the coronary joint as the owner believed but I think it must have been struck or injured in some way.

Bassentene,

ERNEST F. JARDIN, B. V. C.

St. Kitts, British West Indies.

COMPLICATIONS FOLLOWING STRANGLES

The subject, a black, standard bred mare, had a history of having, with twelve other young horses, had a severe attack of strangles at the age of eighteen months of age. In her case there had been complications, two rectal fistulæ, catarrhal inflammation of the vagina and uterus, inflammation of the udder, with a deep abscess in the inguinal tissue, which was drained through the right half of the udder, one gallon of pus having been obtained at the time of the lancing. Under medicinal and biologic treatment she made a complete recovery.

She was kept on pasture until the fall of 1915, January 25, 1916, she had a bad attack of phlegmonous erysipelas, affecting the left half of the udder and the left hind leg. Under treatment she remained in a very serious condition twenty-six days, when pus was detected in the inguinal space. On lancing, fully one gallon of thick, foul-smelling pus was evacuated. Potassium iodid was given for a long period. The mare did well and to all appearances fully recovered.

April 15, 1916, it was noticed that the animal was off her feed; abdomen drawn up and tense, very dejected; temperature 106°. There was an enlarged area as hard as a board on the left flank, eight inches long by four wide. The prognosis was peritonitis resulting from the old infection. The prognosis was very grave. I expected her to die.

I gave treatment of bacterins, quinin and echinacea. Leucocytic extract was given daily for the next six days with thermofuge locally. Mixed infection phylacogen, 12 c. c. daily with echinacea was given, then an injection of streptococcus and staphylococcus vaccine, 200 mil and 250 mil colon vaccine was given, with small doses of nux vomica, iron, gentian, and digitalis as a tonic. The animal was also exercised carefully and fed with grass, boiled oats, bran, etc.

May 11, on the advice of another veterinarian, the animal was turned out to grass with no further medication. At this time her temperature was 101.4° F.; pulse 58. She was blanketed and turned out in a small pasture during the warm part of the day.

May 18, both hind legs were swelling and the temperature was 104° F.; pulse 85 and weak. Tincture of stropanthus and potassium iodid were given. The day following her legs were terribly swollen and blood oozed through the skin. Temperature 102.2°; pulse 45. She had

considerable trouble in getting up. The diagnosis was purpura hemorrhagica. In the evening petechiæ could be seen in the nostrils and mucous membrane of the vulva and vagina.

May 20. Legs a little better, but swelling present around the throat. Injected streptococcus and staphylococcus vaccine combined 500 mil, potassium dichromate solution internally. In the afternoon for colicky pains gave fluid extract of belladonna, passion flower, tincture capsicum, and pulverized formin. In the evening her temperature was 103°; pulse 85; marked edema glottidis; nearly suffocated. Gave her pure guaiacol in water every half hour to hour throughout the night.

May 22. Temperature 101.3°; pulse 80; nose, head and chest badly swollen; looked like a hippopotamus. Bloody discharge from both nostrils; very dull. Gave antistreptococcus serum, 4 c. c. and nuclein 5 c. c., hypodermatically, and potassium dichromate and tincture of ferri chloride per rectum. In the evening breathing was easier; legs and chest more swollen, patches of skin sloughing, also blood oozing through the skin. Gave 6 c. c. serum; had quiet night; defecated twice.

May 23. Temperature 101.2°; pulse 67. Passed urine highly colored and scanty. Ate little grass. Injected adrenalin 1 dr.; also serum 10 c. c. Elixir Saw-Palmetto compound per rectum.

May 24. Temperature, 100.3°; pulse 60. Stronger, little brighter, swelling absorbing. Gave Electuary quinin, iron, gentian and nux vomica. Laid down and rested well in the evening.

May 25. Morning temperature 102.3°; pulse 95. Lying down most of the time, pain in the bowels, purging severely, five or six passages like water, swelling has nearly all absorbed from legs, head, neck and abdomen. Gave morphin sulphane gr. ii, and an ounce capsule of bismuth subnitrate, salol, and pulverized opium, which relieved her. Ate a little grass. Passed small quantity of highly colored urine. Had temperature of 103°; pulse 100 in the evening.

May 26. Morning temperature 102.3°; pulse 95. In great pain, lying down stretched out and getting up and pawing. Purging stopped. Heart pounding. Congestion of bowels. I gave three injections of morphin sulphate and atropin sulphate, a grain and a half of the former and a half grain of the latter. Also gave a capsule of bismuth and opium and followed with fluid extract of belladonna, passion flower and pulverized formin, and controlled the pain with morphine and the heart with tincture strophantus. In the evening, temperature was 102°; pulse 100. During the night a partial prolapse of the rectum occurred, which was greatly swollen and inflamed. The anus being very much dilated. The protruding part was carefully washed in a solution of eucaine and tincture of opium and gently returned, and the anus held until straining ceased. A hypodermic of morphin and atropin, as above, was given, also two drams of adrenalin chlorid in two ounces of water was injected into the rectum.

May 27. Morning temperature 101.4°; pulse 100, and weak. Gave hypodermic of atropin and adrenalin per rectum, and followed with repeated injections of lead acetate and boric acid in solution. In the evening, temperature 102°; pulse 100. Lymph was flowing from the bowels; there was straining and throwing out of the rectum. An enema of several gallons of warm water was given, which washed away a few bots. A small quantity of oleum lini was given by mouth.

Early in the morning of May 28, the rectum was examined and found to be nearly normal. A small quantity of hard feces was felt and two ounces of sodium phosphate followed by a small dose of fluid extract of nux vomica and physostigma was administered. She then purged violently and the heart became very weak, missing beats; jugular pulse. I then gave tincture of strophanthus for the heart, scour mixture and capsule of bismuth and opium for the purging.

May 28, at noon, temperature 102°; pulse 80. Purging stopped, little brighter and licking the walls of stall; heart very weak. One capsule containing bismuth and sodium bicarbonate, quinin and iron was administered, also strophanthus.

May 29, temperature 101.4°; pulse 72, and stronger, much brighter. Gave nuclein, also capsules of naphthalene and tonics. The patient voided a large amount of urine; ate considerable grass. At night, temperature 101.4°; pulse 65 and regular.

May 30. Temperature 101.3°; pulse 63. Lying down, resting well, had small movement of bowels, and ate some grass. Gave one dozen eggs in half gallon of milk, also tonics and rectal injections.

May 31. Temperature 99.2°; pulse 65. Slight pain in the bowels. Gave four ounces of linseed oil and also fluid extract hyoscyamus. Rectal examination disclosed two small abscesses in the top wall of rectum, about nine inches from the anus. These were opened with the fingers and about two ounces of pus and necrotic tissue escaped. Resting well at night.

June 1. Temperature 99°; pulse 70. Much better, bowels moving well, large number of bots passed. Gave tonics, eggs, and enemas.

June 2. Temperature 100°; pulse 70. Feeding well, large number of bed sores, etc., which were attended to.

June 3. Temperature 100°; pulse 65. Dull pain, examined the rectum, abscesses much better and healing. Gave hyoscyamus and echinacea.

June 4. Temperature 100.3°; pulse 65. Improved; passed large number of bots. Eating

well—grass and boiled oats. Feces held in rectum normally.

June 5. Temperature 100°; pulse 60. Stronger, feeding well and bowels moving normally. Echinacea and an enema were given. Echinea and Saw Palmetto compound was administered for four days. Then one ounce of fluid extract of uva ursi was given three times daily until the end of June when the animal was turned out on pasture.

July 30. Temperature 102°; pulse 60. Dull and passing cloudy urine, containing blood clots. Saw Palmetto compound and uritone given for three days, after which she gradually recovered, and by November seemed to be none the worse for her experience. Abscesses in kidneys.)

This young mare did well all winter and was turned out in the spring of 1917 with other horses and colts. Returning home at midnight of May 19, the owner found this young mare alone, beside the stable, dejected and having colicky pains. Pulse 75. Temperature 105.3°. Very dull pain, passing small quantities of thick, bloody, strong smelling urine, containing flakes of pus and blood clots. Gave quinin and salol and fluid extract of belladona and elixir Saw Palmetto compound. (Cystitis.)

May 20. Temperature 105°; pulse 80, in great pain, lying on breast. Injected 10 c. c. antistreptococci serum and 250 mil streptococcus and staphylococcus combined and 200 mil colon vaccine. Gave fluid extract belladonna and potassium acetate and fluid extract uva ursi and formin every two hours. Examined bladder, uterus and kidneys per rectum, found bladder thickened like small tumor and kidneys very sensitive. The bladder contained a small quantity of urine, which was removed. At night, temperature was 106.3°; pulse 35, the animal was frantic with pain and it was with difficulty kept in control with fluid extract hyoscyamus.

May 21. Temperature 106° F.; pulse 80, very little urine. Fluid extract of belladonna, uva ursi and elixir Saw Palmetto compound were given as was also hexamethylenamin. The bladder was flushed with boric acid solution and peroxide. In the evening the temperature was 106° F.; pulse 80. Vulva and vagina were inflamed and spotted like the petechiae of purpura.

May 22. Temperature 104.3°; pulse 75. Easier, passing more urine, drank small quantity of water and ate a little grass. Bowels moving freely. Fluid extract uva ursi, echinacea and Saw Palmetto compound. Bladder flushed with boracic acid solution.

May 23. Temperature 103.2°; pulse 70. Brighter, eating well, a clear, thin serum flowing from the vagina. (Metritis.) Medication repeated.

May 24. Temperature 101.2°; pulse 60. Urine becoming clearer, no pain, much better, little switching of tail. Same medication.

May 25. Temperature 99.3°; pulse 53. Vulva showed a little sloughing. Led out a short distance, kept up medication in smaller dosage.

May 26. Temperature 99°; pulse 44. Vulva clean and healing, doing well. Uva ursi and Saw Palmetto compound given three times daily. Discontinued the flushing.

May 27. Temperature and pulse normal, urine clean. Out on grass pasture about one hour. Had slight relapse, recovered with vaccine and echinacea. Bacterins were injected in increased dosage at intervals of five days, for three weeks. There was no reaction from the last injection of bacterins. Was then turned out on pasture and has done well since. She is one of my team of drivers at the present time.

This case was a most interesting and yet worrying one to me. This mare, being my own, I was in attendance continually during the serious part of her illnesses. From a financial point of view this mare was a dead loss as more than her value was spent in drugs and time upon her. Could all these affections have their origin from the complicated attack of strangles? During the first few days of the peritonitis she was saturated with echinacea, which I believe saved her life. While marked symptoms of asphyxia occurred during the purpura, two men failed to prevent her from going to the door of the stable and pushing her head out in the open air. The rapid subsidence of the swelling was most extraordinary. I believe the adrenalin and atropin acted well as vasoconstrictors when the internal organs were involved during the purpura. This mare would surely have died if she had been left to conservative treatment. I believe the specific indications in disease should be met by specific medication.

References: A System of Veterinary Medicine, Hoare; Quitman's Materia Medica; Ellingwood's Materia Medica; Merillat's Surgeries; Veterinary Journal No. 487, Vol. 72, Observations on Purpura Hemorrhagica in the Horse, with Addenda of Allied Affections, by Fred C. Mahon, M. R. C. V. S.

Mungo T. Lewis,
Veterinary Student.
Stonewall, Manitoba, Canada.

Comment by E. L. Q.—The rather unusual complications related by you were without doubt due to strangles. You showed great ability as a clear thinker, keen on deductions, and a sharp observer, all of which are essential features in making a good diagnostician. Your therapeutics were in the main well chosen. I fear, however, that the pyemia must have caused endocarditis, and as the valvular insufficiency (incidental thereto) increases she may die suddenly. If so, post her and you will find a number of interesting features, such as endocarditis, thickened cardiac valves, abscess scars in the kidneys and liver, adhesions, etc. Should you have an opportunity to post the animal, we should like

to have a report of it to supplement this very interesting case report. However, we hope this will be postponed for many years, as you certainly spent enough time and money on the animal to merit at least ten years' service. Your skill and bull dog pertinacity combined to save the patient.

"TELL IT NOT IN GATH, PUBLISH IT NOT IN THE STREETS OF ASKELON"

In the December, 1918, issue of *Field and Stream*, the editor of the kennel department has the following to say about a new cure for distemper:

"Quite recently it was brought to our attention that practicing veterinarians had discovered that vaccinating the dog with ordinary commercial hog cholera serum would bring about the most remarkable recoveries, and had successfully treated dogs in which the disease had progressed almost to the last stages. The men mentioned are inclined to treat the matter with considerable secrecy, but we are personally of the opinion that if—as seems to be the case from our information—hog cholera serum can accomplish some success against this most troublesome disease, the information belongs to every dog owner and dog lover throughout the world."

BRUCIN

Brucin is represented by the formula $C_{23}H_{26}N_2O_4$ and occurs in nux vomica seeds (*Strychnos nux vomica Nat. ord. Logamaceae*) in about about one-half to one per cent. The salts of brucin are freely soluble.

While the best known and most frequently used of the two alkaloids of nux vomica is strychnin, brucin is none the less of service in its field.

Pharmacology. Authorities differ widely as to the physiologic action of brucin. Murrell calls it a mild strychnin, while Cushny states that brucin exerts more action than strychnin on the nerve-ends in voluntary muscles. The action of brucin is undoubtedly similar to strychnin but so different in some points that choice should be made where one has advantages over the other.

In human practice brucin is to be preferred to strychnin in children because it is forty times less convulsant. Brucin is indicated in adults if very susceptible to strychnin.

Therapeutics. Brucin should be more often used in veterinary practice, especially in toy dogs which are extremely susceptible to strychnin—Buckley, East Orange, N. J. Its indications are covered broadly by the term tonic.

Administration. For prompt action brucin should be given subcutaneously. As a tonic the one-half milligram (1/128 gr.) dose three times a day is sufficient for toy dogs. Strychnin dosage should be followed.

Arecolin

This is an alkaloid from Areca catechu (betel nut) having the chemical formula $C_8H_{13}NO_2$. The areca or betel nut contains about one-tenth of one per cent alkaloid.

Pharmacology. This is one of the more recently introduced active principles. For years Areca catechu was used only as the powdered areca nut as a vermifuge for dogs. With the recent studies on its alkaloids it has come rapidly into prominence.

As seen by the formula, arecolin is a liquid alkaloid. Its salts are crystalline and the hydrobromide is non-hygroscopic. Arecolin hydrobromide is a reliable and rapid-acting cathartic.

It increases the flow of saliva, sweat and intestinal fluids and stimulates peristalsis. Arecolin is less toxic than barium chlorid or eserin, although in large (toxic) doses it paralyzes the heart.

This alkaloid reduces the pulse and in poisonous doses produces respiratory as well as cardiac depression. For this reason some practitioners combine strychnin with every dose.

Arecolin is effective in laminitis and in inflammation of the brain. An interesting case report on the treatment of laminitis with arecolin and aconitin is found in the (March, 1914) AMERICAN JOURNAL VETERINARY MEDICINE. It is much used in the colics and indigestion but should not be used in extreme intestinal flatulence and positively not in gastric flatulence.

For colics arecolin is the remedy of first thought as one of the most dependable of the rapidly acting hypodermic cathartics.

While some authorities condemn arecolin in impaction, its use in this condition is increasing. Here especially is where the small dose is effective if repeated in twenty-minute intervals. If the alkoloid fails, then give a two-ounce dose of sodium phosphate at two-hour intervals. Arecolin acts equally well in horses and cattle. In impacted rumen its results are most pleasing and many cases of mammitis are also benefited by its administration. In the latter, arecolin removes a serious source of intoxication by free purgation. This should be followed by aconitin in one-seventy-second grain doses at hourly intervals until the fever falls and its physiologic effect is manifest. Phytolacca should also be given, because of its beneficial action on the mammary gland in such cases.

It is not generally known that arecolin is of value in azoturia. The pathologist has yet to give us the exact condition but for empirical reasons only, arecolin should be used. Azoturia calls for elimination and arecolin is the most prompt in its action of all the sources at command.

While usually employed in equine practice

arecolin has been used in canine work as an effective hypodermic cathartic in one-thirtieth-grain dose.

Arecolin does not belong in that small class of our materia medica known as specifics—it occasionally fails. Possibly the dose given has been too small,—proper dosage means **dose enough.** At the same time safety first must be kept in mind and caution must be exercised not to approach the toxic limit.

As previously mentioned, arecolin is useful in canine practice but seldom used because of the ease and satisfactory results with which other cathartics act.

Administration:—Arecolin hydrobromid is given to horses in doses of one-half to one and five-tenth grain, hypodermically. It usually acts in fifteen to twenty minutes. In some cases we find its effect more pronounced on the saliva, causing a profuse flow without the usual peristalsis. The tendency seems to be in favor of the smaller dose repeated, if necessary, in a half hour. In fact, many experienced veterinarians will under no circumstances give more than a half grain per thousand pounds weight.

Atropin

Atropin is one of several alkaloids found principally in the leaves and root of Atropa belladonna and found also in other plants of the Solanaceae. A number of salts of atropin

Pharmacology. Atropin is both absorbed and eliminated with rapidity. It is impossible to state definitely what organs or functions are most affected by this alkaloid. In fact its action is so varied (though certain and constant) as Waugh says: "No drug is of greater interest than atropin. The more the science of drug action is studied the greater is the tendency to put this powerful alkaloid into the place heretofore occupied by morphin." The hemostatic action of atropin is most valuable. It has been shown that the superficial vessels are capable of holding 700 times the arterial blood. Hence the value of atropin in hemorrhage. Vascular tension is raised by exciting the vasomotor center.

While emetin and atropin are running a close race for preference in hemorrhage, the latter is so well known that it is usually kept on hand. Its efficacy in hemorrhage is often overlooked, and we emphasize its value here especially in those persistent and annoying "bleeders" sometimes seen after castration.

The toxic action of atropin is expressed as a fall in blood pressure secondary to the initial temporary stimulation. Morphin in guarded doses is its physiologic antagonist.

On the nervous system atropin acts at first, as a motor and sensory excitant. In doses approximating the toxic we have delirium, especially in the feline family. Some horses are similarly affected. This is generally true of all alkaloids of the Solanaceae.

Atropin is a respiratory stimulant reducing the frequency, and increasing the depth of respiration. This fact should be borne in mind by veterinarians—it is second in importance only to its hemostatic power.

All the body secretions are retarded with the exception of the urine which is sometimes increased.

Atropin increases bodily heat. It is eliminated by the kidneys and bowels and a drop of urine from a fatal case in the eye of an animal will cause dilation of the pupil.

Therapeutics. One of our best antispasmodics is atropin, shared of course by the other mydriatic alkaloids, hyoscyamin, hyoscin, scopolamin, cocain and gelsemin. Atropin is, therefore, a first thought in colic (spasmodic). Use it therefore in muscle spasm in horse and cattle colic. Acute pain is usually spasmodic (unless mechanical as from injury or foreign body), and as such demands the antispasmodics, not morphin. The latter is indicated more in inflammatory pain, but early pain is not inflammatory since the necessary pathologic changes have not taken place. Because of its ability to raise the body heat atropin is indicated in parturient paresis.

It must be remembered that in a sense atropin is of service in inflammation, acting as a derivative by increasing the force of the blood pressure, tending thus to overcome stasis. It should be used early and late in pneumonia. In cystitis atropin is of undoubted value. Mammitis calls for atropin, more often used, however, as *Unguentum Belladonnae.*

Atropin sulphate is used by dog specialists to dry up the milk in bitches. It is also used in urinary retention in old dogs. Here the small dose of one-two hundred and fiftieth grain is often sufficient. Some cases of persistent vomiting are relieved by atropin. Here it is necessary to use it hypodermically.

In many cases of epileptic convulsions of dogs, atropin sulphate, grain one-six hundredth, with glonoin (nitroglycerin), grain one-five hundredth, will give prompt relief.

By allaying irritation of the peripheral nerve fibers, atropin is of service in cough. It is also used as an efficient mydriatic, one to four grains to the ounce of water being the proper strength and a few drops the dose. As a component of most cathartic formulae atropin is added to depress the inhibitory nerves of the intestine and modify the too severe action of the other ingredients. It is also useful to allay severe paroxysms of heaves in horses in one-grain doses, given hypodermatically.

Administration. Atropin sulphate is given to the horse in doses of one-fourth grain re-

peated at hourly intervals. The dose for dogs is one-hundredth grain or not more than one-fiftieth grain. However, it is comparatively non-toxic in dogs even in much larger doses. In eye work simple instillation is effective. In acute conditions the hypodermatic use only is to be considered. As belladonna ointment the atropin therein acts locally in mammitis. In muscle spasm in horses give one grain deep into the muscle affected.

Chicago. F. B. KIRBY.

UNUSUAL COMPLICATIONS ACCOMPANYING STRANGLES

I was recently called to examine three horses that had sore mouths and were drooling badly. They proved to be typical cases of stomatitis, a 1,400-pound gelding, the first one to show symptoms, being in particularly bad condition. The mucosa of the cheeks and intradermal space showed the characteristic hard base with pustular center. The tongue in spots was denuded of membrane and resembled the form shown during the outbreak of 1917 at the yards.

The animals recovered with good care. A solution of soluble iodin was placed in front of them where they washed their mouths at intervals, especially after eating. Three weeks later the gelding was reported as having difficulty in defecation, especially when on the road, he would stop, strain and groan terribly, the driver said. I found the rectum in about the same condition as the mouth had been three weeks before. Iodin, three grains to the ounce, was given in linseed oil with enemas of potassium permanganate, daily. A thorough cleaning of the stalls, harness, etc., eliminated further trouble.

Chicago, Ill. JAS. ROBERTSON.

PARTURIENT PARESIS IN THE COW

Among the first cases that were presented for treatment upon my return to the practice of veterinary medicine, was a case of parturient paresis in a cow, which presented a feature of interest, though not of uncommon occurrence.

The history was that the subject, a five-year old grade Jersey cow and a very good milker, had been developing such a large udder that the owner thought it best to milk her once daily for about ten days before calving time. The calf was born at night and so far as is known, without difficulty, but along about mid-day, the cow was noticeably unsteady on her feet, and by four o'clock in the afternon she had gone down. I was called and saw the animal about two hours later.

The symptoms presented did not differ from those ordinarily seen in such cases; there was the characteristic attitude with the nose in the flank; respiration seemed accelerated, sensibility dulled and the temperature subnormal. The case had not progressed to such a point that the animal was comatose, but there was some groaning with every breath and the subject was decidedly uncomfortable. The placental membranes had been expelled; the uterine walls had contracted considerably; and the cervix was partially closed; but there was present within the cervical canal the usual quantity of that viscid, whitish coagulum that may be found in all such cases. The udder was very large and tense but did not contain much milk and did not seem to be inflamed in the least.

The treatment consisted simply in inflation of the udder with air and the administration of one-fourth grain of strychnin sulphate subcutaneously. The sphincter muscles of the teats were lax, so it was thought best to apply tapes about the extremities of the teats to prevent the escape of air. The owner was instructed to remove these tapes after about two and one-half hours, and one-fourth grain dose of strychnin sulphate was left to be administered by the mouth, with instructions that the first dose be given three or four hours after the one given hypodermically.

At seven o'clock the following morning, I was informed by telephone that the cow was still down but apparently comfortable, seeming to take an interest in what took place about her. However, she made no effort to get up even when encouraged to do so. It was impossible for me to see the cow again until nearly two o'clock on the afternoon of the second day, when I found her in practically the same condition that she was at my first visit. The treatment formerly given was repeated, and instructions given to the owner to give one-fourth grain doses of strychnin sulphate every three hours. The following morning I was informed that the cow was on her feet, and except for the fact that the udder contained very little milk and some constipation existed, the cow seemed to be in a normal condition.

In thinking of this case and of other similar cases that I have treated in years past, I wondered if the clinical phenomena presented in such cases were not good arguments to support the claims made by those who contend that parturient paresis in the cow is occasioned by sudden unequal distribution of the blood (mammary congestion and cerebral anemia) and is not a puerperal intoxication. In a derangement that would occasion symptoms of marked disturbance such as may be observed in parturient paresis, it does not seem possible that complete recovery would occur after the trouble had been existing so long if it were due to an intoxication of any sort.

Evanston, Ill. J. V. LACROIX.

WHAT A COUNTY AGENT SHOULD NOT BE

As an example of what a county agent should not be, the activities of the county agent of Lyons county, Minn., may be cited. Our informant states that when it comes to "gall," this agent has them all beaten. It is said he made over five hundred calls during 1918, and as a consequence more stock has been lost during the past two years than in any ten years before, due to the fact that the people think they are getting "something for nothing" and fail to call a veterinarian when their animals are seriously ill.

A portion of his "message to the farmers," appearing in a local paper, speaks for itself It is as follows:

"Just as soon as your hogs become sick, call the county agent. He will diagnose the case for you and offer the assistance necessary. This applies to other animal diseases as well. It costs you nothing for his services, which are free to everybody."

OPERATION FOR THE RELIEF OF QUITTOR IN THE HORSE*

I have been asked to write a short description of a method of operating on quittor in the horse which has met with considerable success in dealing with this condition as we find it in war-time. I do not claim that the operation is original, but I have not seen it described in the literature. This method was arrived at in the course of operating on over 1,000 quittors. Every one who has had any considerable dealing with the condition knows that speaking accurately, every quittor needs dealing with on its merits; but the operation I describe is one that can be approximately applied to the ordinary quittor with two or three sinuses above the coronary band.

I do not propose to discuss the etiology, etc., of quittors. That has already been amply dealt with.

Suppose, for the sake of example, we have a horse with a quittor on the outside of the near fore foot (the operation is the same whatever the position, the only difference being in the casting and fixing of the limb). The shoe is removed, the foot trimmed, the heel lowered, if not already low (an essential factor for good healing), the hair clipped off to the fetlock, and the foot well washed with soap and warm water, washing all the sole and heel as carefully as the coronary surface. The animal is then cast on the off side, the near fore foot taken out of the hobble, a bandage put around the leg above the fetlock on both near fore and hind legs, and the near fore leg drawn back on to the near hind and tied into position and a tourniquet applied above the fetlock. The seat of operation is then washed and painted over with methylated spirit, which is lighted and allowed to burn for five to ten seconds. The foot clamp (see illustration) is applied to the leg to keep the limb rigid and also to flatten out the pedal bursa, and render it less liable to accidental injury during operation. Chloroform is then administered.

After probing the sinuses to get an idea of their extent and direction, an incision is made above the coronet, over the anterior border of the cartilage (No. 1 in diagram), removing an elliptical piece of skin about one to one and a half inches long and three-fourths of an inch wide, varying with the size of the foot. Then a second incision is made in the heel on the posterior border of the cartilage (No. 2 in diagram), removing another elliptical piece of skin from one to two inches long and about one inch wide. The large size of these wounds is rather a favorable factor, as one is able to work freely and see easily, and the wounds heal rapidly.

French curved hoof knives are now used to remove the cartilage as follows: Beginning at the heel incision, a left curved knife is passed outside the cartilage (between it and the skin and hoof), cutting downward and forward till the knife appears at the anterior wound. Then, working from the anterior wound, the outside dissection of the cartilage is continued backward and forward till it is quite free. Working again from the heel, and with a right curved knife, the knife is passed from the outside of the cartilage up over the upper edge and down on the inside of the cartilage, care being taken to keep the point and edge close against the cartilage to avoid cutting the bursa. Still working from the heel, the dissection is carried on forward and downward till the cartilage is free on the inside; also with a hook-ended hoof knife or a renette, the anterior border of the cartilage is freed next, and it only remains to cut away the cartilage from its lower attachment, which is easily done working from the inside and cutting outward, and it comes away practically whole, leaving a long cavity in the foot, covered with a strong bridge of skin and tissue and lit, if one may say so, by two windows.

At this stage a word of warning: I said the cartilage comes away practically whole. There still remains a small portion in the pit in front of the wing of the os pedis, and this small piece is diseased in a large percentage of cases and would, if left, lead to one of those annoying occurrences which we all have known to our sorrow. This piece is easily removed with a renette or a Volkman's scoop, and then the whole cavity can be scrutinized for further sign of necrosis or loose tissue. This scrutinizing is greatly facilitated by the use of a small electric torch about the size of a fountain pen, which can be put in at either window and the whole interior made plainly visible. All such

*The Veterinary Journal, London, March, 1919.

necrosed or loose pieces should be removed and the wound cleansed. The chloroform muzzle is now removed. There only remains the dressing and bandaging. The choice of dressing is varied. Boracic acid, eusol or B. I. P. (bismuth, iodoform and paraffin) all do excellently. The wound is packed with the selected dressing, care being taken that no solid material, such as wool or gauze, is put in.

A long piece of sterilized gauze is now taken and wound around the coronet and heel, covering both the wounds, then a good sized pad of tow is applied over the seat of operation, padding the heel well to prevent chafing, and this is kept in position by means of a strong bandage which is carried well up the pastern.

The idea of applying the gauze as described is to prevent this tow pad working its way into either wound and so prevent closing.

The whole is again covered with another bandage, the tourniquet removed and then the animal allowed to rise. There may be some slight hemorrhage, which soon ceases. The dressings are allowed to remain on fourteen to twenty-one days with no further attention, except perhaps to replace the outer bandages should they become displaced. During the time elapsing between operation and the removal of the dressing, the horse's temperature should be taken daily, as occasionally one finds it going up somewhat alarmingly, when it becomes necessary to remove and reapply the bandages leaving the top pad *in situ*, the fever being induced by overtight bandaging, it is rarely necessary to remove the dressings themselves.

On finally removing the dressings, the foot is usually somewhat dirty, but when cleaned the cavity in the foot is found to be filled up and the two primary incisions reduced to about a quarter of their original size and appearing as simple surface wounds, needing only ordinary dressings for about a week. The foot can be washed as soon as the bandages are taken off. The whole process of recovery should be completed in from twenty-one to thirty days.

The advantages claimed for this method are:

1. No interference with the hoof or coronary band.
2. Simplicity in after-treatment.
3. Quickness in operation.

With regard to the time taken in operating, from the length of this description it may appear a somewhat lengthy process, but in actuality and with the practice and experience which fortunately or unfortunately one gets in war time, the whole thing becomes a very simple matter, and the actual operation can be completed in from five to ten minutes, which

Method of fixing a hind limb for operation on a quittor inside of heel.

compares favorably with the time taken in some of the so-called classical operations.

With regard to shoeing the foot after operation for quittor, it has been found that shoeing with a three-quarter shoe, with the deficient quarter under the seat of operation, has a very beneficial effect on the soundness of the gait of the horse and the subsequent good shape of the hoof, counteracting the tendency to hypertrophied growth of the coronet.

In my opening remarks I described this article "Operation for Quittor in the Horse." It must not be taken as applying also to the mule, as I found that our long-eared friends needed tackling in an entirely different manner, which I hope to describe at a later date.

MAJOR BAGSHAW, R. A. V. C.
British Expeditionary Force, France.

INFECTIOUS ABORTION OF SOWS

During the past year there have been a number of inquiries at the Ky. Agri. station relative to abortion in sows. Of late we have been notified of serious outbreaks in certain sections of the country. It would appear that this disease is more prevalent than is commonly believed. A review of the findings of the Kentucky Experiment Station as to the etiology of this disease may be of value.

The first organism definitely shown to be an etiological factor in infectious abortion of animals was discovered by Dr. Bang, of Denmark, in 1896, and named Bacillus abortus. After it was proved that this bacillus was the cause of the disease in the cow it was largely taken for granted that it caused the disease in other animals as well. In 1911 this laboratory isolated the germ causing the disease in the mare. It was found that the Bacillus abortus (Bang) had nothing to do with the disease in the mare. We placed the organism isolated in the intermediate group of the colon-typhoid group. The name Bacillus abortivo-equinus was given to this germ. This germ will produce abortion in the mare both by inoculations and feeding. After we had obtained these results we felt quite certain that infectious abortion in each species of animal was caused by a specific organism, and this is usually thought to be the case by investigators today.

In 1916 we were notified that 20 sows on one farm had aborted within a few days' time. We made a trip to the place and were able to secure two fetuses with attached afterbirths. These pigs were aborted the night before. The fetuses were fairly well developed, although not far enough along to have any hair. On one of the afterbirths there were noted numerous brownish, villus-like projections ranging in diameter from 1 to 2 millimeters. They were so numerous in some places as to be confluent. From appearances the kidneys of the pigs were much enlarged and gorged with blood. On casual examination of the bacterial cultures we were led to believe that they contained nothing but the growth of bacteria usually encountered. Upon examination of one of the plates carefully under a microscope, we found a few colonies of bacteria which resembled in every respect those of the Bacillus abortus (Bang), On examining other plates we found the same type of colony from the streaks of the afterbirth, from the nodule-like growths on the afterbirth and from the streak dilutions of the heart, liver and stomach contents of each fetus. Upon examining stained preparations of these colonies, germs identical with the Bacillus abortus (Bang) were noted. Dilutions of these colonies grew readily in the air, which is unlike the Bang bacillus, in that this organism has to be incubated several generations by the Novak method before it will grow in the air. The colonies of the organism, however, and the morphology were so identical with that of the bacillus causing the disease in the cow that we concluded to put it to all the biological tests of that organism as well as to subject it to inoculation experiments.—*Breeders' Gazette.*

RAPID HEALING OF WOUND IN THE SPONGY TISSUE OF THE PENIS

A grade Collie dog was brought to my hospital about April 15th, bleeding from time to time in the form of large clots from the sheath. On careful examination it was found that the spongy tissue of the penis had been cut down through at right angles to the bone, making a transverse wound about an inch long, near which was another smaller wound.

The wound was dressed with tincture of iodin full strength with a view of cauterizing the cut tissue, after which it was carefully sutured. Only one hemorrhage took place after about two days. On the eighth day the wound had completely healed, which is somewhat surprising, since wounds in this spongy tissue are often troublesome affairs.

The presumption is that some cruel rascal tried to separate the dog from a bitch with a knife. We are looking for him with a view of prosecuting him for cruelty to animals. A jail sentence should be inflicted in such a case.

A. H. BAKER.
Chicago, Ill.